NEW ZEALAND'S LEADING COMPUTER MAGAZINE

BITS & BYTES

June 1986. $2.25

Reviews:

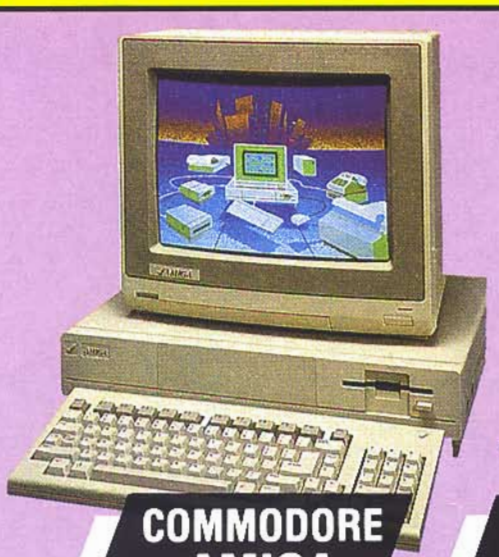
Amiga / VP-Planner / AMPS m'user /
The UK scene / PC86 Show & Software Awards

Also featuring:

Prepurchase advice / more w/p options / 3-D programming /
RAM expansion / another home spreadsheet / Acorn's future ...

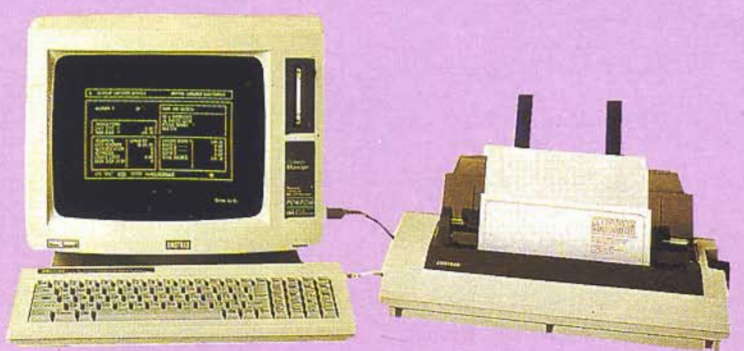
New series: Q + A

PORTERFIELD

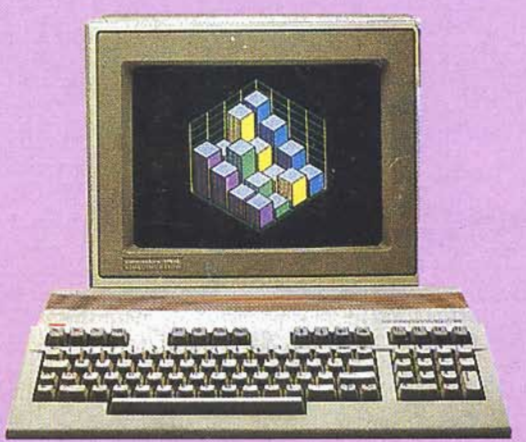


COMMODORE
AMIGA

ATARI
520 ST



AMSTRAD
8256



COMMODORE
128/D

ALL MAJOR CREDIT CARDS WELCOME

WELLINGTON:
Porterfield Computers
84 Victoria St.,
Ph: 731-097

Latest Hardware
Hottest Software
Fastest Service

AUCKLAND:
Porterfield Computers
415 Dominion Rd.
Ph: 686-084

PORTERFIELD

microbee update:

For 1986 we are proud to announce a Premium series to augment our existing range..

The new models offer as standard all the main features offered as optional extras on our standard models. Plus some new features and an upgrade in performance.

This shows the graphics resolution of the new Premium microbees. It is possible to display 131,072 individually controlled pixels.

Of course the Premium models will cost a little more, but they're still cheaper than upgrading later. Briefly you get: Videotex and colour video as standard; greatly enhanced graphics capability; four extra keys for cursor control; improved video circuitry and a volume control for the internal speaker.

These improvements increase the flexibility of a Modular Microbee computer and let you choose the computer that's right for you.

New Premium version available-all microbees.

Example: Microbee Modular 128K Computer

Standard

The 128K floppy disk based system designed for serious home or business work. With 128K of user RAM memory it is compatible with your choice of 5.25-in or 3.5-in disk drives and comes with an enhanced CP/M operating system and user friendly icon menu shell with Telcom communications programme.
Choose from Microbee's range of monitors, printer, modem and world standard software to build the system that suits you. Software available includes Wordstar 3.3 Professional Pack, Microsoft Multiplan, and BASIC.

Premium

The Premium version of the 128K Computer provides all of the features of the standard model.

PLUS

- Videotex and colour video inbuilt
- Greatly expanded graphics: 131,072 pixels
- Four extra keys for cursor control
- Upgraded colour and keyboard circuitry
- Sound volume control

*Standard model above shown with economy monochrome monitor

Microbee Systems NZ Ltd

438 b Rosebank Road, Avondale, Auckland
Telephone: (09) 88 1138 or 88 1139.

Wellington: P.O. Box 26 045 Newlands, Wellington. Telephone: (04) 78 5548.

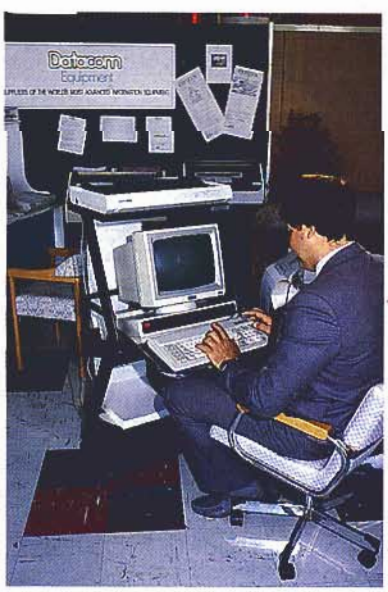
MBS0018


№1


olivetti


Canon


SPECTRAVIDEO


Datacom
Equipment

PC86: Busy and brilliant

PC86 has come and gone in Auckland.

During three mad days of May some 50 exhibitors were confronting a deluge of queries and requests from an estimated 12,000 visitors to the show.

Ironically the number of exhibitors was slightly down on last year's show, but the amount of trading was significantly busier.

During a so-called recession in the computer market, this upturn of trade at the show was an encouraging sign of renewed confidence in purchasing computer bits.

Without exception, exhibitors reported hectic business being done at PC86.

From the visitors' point-of-view there were obviously exhibits of intense interest, and indeed worth investing in, and there was an appreciation of computer companies bringing forward new products.

Commodore Computers NZ Ltd launched the Amiga (see reviews in this issue), Olivetti launched three new machines (upcoming reviews), and other distributors were unveiling the latest in their ranges of printers and network systems.

Seminar sessions, using screen projections, were well attended, as was an auction.

The pictures on these pages convey the vibrancy of PC86, which was held at the Princes Wharf terminal complex in downtown Auckland.

The next show on the Bits and Bytes calendar is the Wellington Computer Show on July 10, 11 and 12 at the Overseas Terminal.

See you there.

Software Awards: *Dr John Bircham, for Gropas.*
Jim Ferguson, of Otakou Software.

IBM lap PC

The IBM lap-portable, released in the US On April 2 and selling well there for US$1995, was soon to be launched here, according to at least two dealers (one of IBM PCs, the other of a competing brand).

But IBM NZ late last month, was still unable to confirm a release date, and declined to speculate on the portable's release and its probable price.

We do know that the preceding portable model, the "luggable" PPC, was heavily discounted by dealers, to $2995, and that this seemed to be in anticipation of the new machine's arrival.

IBM did say that the PPC was now in very short supply.

How much should you spend on computers and software?

Look at these prices and then decide.

Call Richard Barker today at (024) 774-464 to discuss your needs.

SYSTEM UNITS	Retail Price
AT Comp. with 20Mb HD and 1.2Mb Floppy	$7,500
XT Comp. 256K/2x360K Floppies/Par/Keybrd/No Mon	$1,890
XT Comp. 640K/2x360K Floppies/Par/Keybrd/Monitor/Clock	$2,895
XT Comp. 256K/2x360K Floppies/Par/Keybrd/10Mb/No Mon	$3,695
XT Comp. 256K/2x360K Floppies/Par/Keybrd/20Mb/No Mon	$4,095
MAGNUM TURBO 4.77/8.0MHz/640K/1x360K Floppy	$1,995
MAGNUM TURBO 4.77/8.0MHz/640K/2x360K Floppies	$2,295
MAGNUM TURBO 4.77/8.0MHz/640K/2x360K Floppies/10Mb	$3,995
MAGNUM TURBO 4.77/8.0MHz/640K/2x360K Floppies/20Mb	$4,495

MONITORS	
RGB Colour Monitor	$1,050
RGB Colour Monitor + Medium Res. Graphics Card	$1,195
Hi-Res (TTL) Mono Monitor	$395
Hi-Res (TTL) Mono Monitor + Graphics Card	$595
Green Monitor	$295

DISKS AND CONTROLLER CARDS	
Seagate ST213 10Mb	$1,295
Seagate ST213 10Mb + Omti Controller + Cables	$1,795
Seagate ST225 20Mb HH	$1,695
Seagate ST225 20Mb + Omti Controller + Cables	$2,195
Seagate 32Mb Full Height Hi Perf/Self Park	$3,195
Control Data 85Mb Plated Media/Self Park	$6,995
Omti HD Controller Card	
Teac HH Floppy Drive	

… 5¼" (To 750K)	each $4.50
… and Certified 5¼" (To 1.2Mb)	each $8.50
… 100% Guaranteed and Certified 3½" (To 400K)	each $7.00
DSDD 100% Guaranteed and Certified 3½" (To 850K)	each $8.50

UPGRADES	
4.77 MHz Multifunction Board	$375
8 MHz Multifunction Board	$375
4.77 MHz Multifunction Board WITH 384K	$475
8087 Co-Processor	$425
Hercules Compatible Graphics Card	$395
RS232 Card	$125
Parallel Card (Centronics)	$75
64K Chips - 16K 150ns DRAM	$3.75
240v 135 Watt Power Supply	$495
Floppy Controller Card	$150

PRINTERS	Retail Price
Panasonic KXP1090-10", Par., 100cps, NLQ, 80-132 Col	$595
Panasonic KXP1091-10", Par., 120cps, NLQ, 80-132 Col	$745
Panasonic KXP1092-10", Par., 180cps, NLQ, 80-132 Col	$1,150
Panasonic KXP1592-15", Par., 180cps, NLQ, 136-230 Col	$1,550
NDK 5025-15", Par./Serial, 180cps, NLQ, 24 pin	$3,495
C.ITOH CI300-15", Par./Serial, 300lpm, NLQ, + Stand	$11,750
C.ITOH CI600-15", Par./Serial, 600lpm, NLQ, + Stand	$14,500
Dataproducts 8020/21/22-15", Par./Serial, NLQ, 180cps	$1,295
Dataproducts 8070/71/72-15", Par./Serial, - Colour Avail	$3,795
Dataproducts DP-20 Daisywheel Par./Serial	$1,295
Toshiba 24 Pin Printer - 15", NLQ, Par./Serial	$2,800
Toshiba 24 Pin Printer Bin Sheet Feeder	$1,650
Toshiba 24 Pin Printer Tractor Feed	$300
Mitsubishi DX120 10", 18 Pin, 120cps, Par., 80-132 Col	$995
Misubishi EP180EX 10", 18 Pin, 180cps, Par., 80-132 Col., 3K	$1.095
Mitsubishi EP1800 15", 18 Pin, 180cps, Par., 136-230 Col., 3K	$1,495
Mitsubishi DX180 10", 18 Pin, 180cps, Par., 80-132 Col., 15K	$1,345
Mitsubishi DX180W 15", 18 Pin, 180cps, Par., 136-230 Col., 15K	$1,695
Juki 6100, Daisywheel, 15", Bi-Directional, 18cps, Par	$1,520
Juki 6300, Daisywheel, 15", Bi-Directional, 40cps, Par	

SOFTWARE	
Samna III	
Samna Legal Di…	
…	$1,295
…	$175
… (Protected)	$125
… Turbo Editor Toolbox	$145
Borland Turbo Database Toolbox	$145
Borland Turbo Gameworks	$145
Borland Turbo Graphix Toolbox	$145
Borland Turbo Tutor	$99
Borland Lightning	$225
Borland Turbo Pascal Ver. 3.0	$175
Borland Turbo Pascal with 8087 Ver 3.0	$225
Borland Reflex	$275
Borland Prolog — NEW —	$335
Fastback	$295
Microsoft Pascal	$625
Keyworks	$195
Ready	$125
Norton Utilities Ver. 3.1	$245
Crosstalk XVI	$375
Dac Easy (US Ver.) GL/AR/AP/PO/Billing/Inv./Forecasting	$250
Timeline Ver. 2.0 Project Scheduling Easy to use/Top Performer	$875
Before You Leap - Cocomo-based Software Dev. Cost Model	$995
MS-DOS 3.1	$275

By the time you read this, many of our prices will have been REDUCED and we will have NEW products! Before you buy anything, call us (024) 774-464, COLLECT.

SERVICE AND SUPPORT: Prices include Sales Tax and are subject to change without notice. Computers are 100% MS-DOS Compatible, have 12-month Guarantee. *Diskettes carry No-Questions Asked Replacement Guarantee. Printers carry 90 Day Guarantee. Telephone support available for software.*

To order use this form:

Please supply the following: ____

NAME: ____

COMPANY: ____

ADDRESS: ____

CITY: ____

PHONE No: ____

Cheque Enclosed ☐ Please charge my credit card ☐
Visa ☐ American Express ☐ Diners Club ☐ Bankcard ☐

Card Number: ____

Expiry Date: ____

Signature: ____

All orders must be accompanied by a cheque, money order, postal note or credit card number. All orders must be signed. Your money will not be banked until after your order is despatched.

For even faster service call (024) 774 464

REMARKABLE ENTERPRISES LTD

(Computer Division)
7 Crawford Street, Dunedin
Freepost 191, P.O. Box 1415, Dunedin
Telephone (024) 774-464, FAX (024) 772-948
Telex NZ 5406 REMPAR

For further information and a complete price list of MS-DOS Computers, Tape Units, Diskettes, Printers and Software, call or write today.

BITS & BYTES

June 1986 Vol. 4, no. 9

COLUMNS:

BITS AND BYTES magazine is published monthly (excepting January) by Bits and Bytes Ltd, Denby House, third floor, 156 Parnell Road. PO Box 9870, Auckland 1. Phone 796-776, 796-775. **EDITORIAL:** managing editor, Gaie Ellis; editor, Steven Searle; Christchurch reporter, Dion Crooks, 66-566. **ADVERTISING:** Auckland – Peter Biggs, PO Box 9870, 796-775; Wellington – Vicki Eckford, 753-207; Christchurch – Jocelyn Howard, PO Box 827, 66-566. **SUBSCRIPTIONS:** First floor, Oxford Court, 222 Oxford Tce, Christchurch, PO Box 827, Phone 66-566. Manager, Mavis Shirtcliffe. **SUBSCRIPTION RATE:** $18 for 11 issues, school pupils rate $16. Overseas subs are $27/year surface mail, and airmail rates of $59 (Australia, South Pacific), $86 (North America and Asia), annd $108 (Europe, South America, Middle East). **BOOK CLUB:** manager, Dion Crooks, at above Christchurch address, 66-566. **DISTRIBUTION INQUIRIES:** bookshops to Gordon and Gotch Ltd, computer stores to publisher. **PRODUCTION:** graphic designer, Roger Guise; Typesetter, Monoset; printer, Rodney and Waitemata Times.

Home-grown and high-class

Top prize in the New Zealand Personal Computer Software Awards went to Soft-Tech, of Hamilton, for an auluminium joinery costing package.

David Price (pictured) received a $2000 cheque on behalf of Soft-Tech, and the gold-plate award from the NZ Advanced Technology Trust.

Presenting the software awards was Mr Jonathan Hunt, the Minister of the Post Office. The Post Office, and Bits and Bytes, and the Advanced technology Trust, were co-sponsors of this year's awards event.

The silver award went to Dr John Bircham, also of Hamilton, for his Gropas software enabling farmers to analyse and predict pasture growth and stock performance.

The bronze award went to Otakou Software, of Dunedin, for its educational Twist-a-Plot suite of three programmes.

The awards were in four categories: business, farming, education and entertainment.

Education

In education, software developers are emulating business software trends in fully employing clever graphics.

Otakau's programmes, running on Apple IIs, were developed by Jim Ferguson, Chris Hilder and John Shanks. The suite encourages children to write with a simple word-processor and integrate illustrations from a pre-entered library.

It comes with a spelling checker, and a simple but elegant graphics generator, called Sorcerer's Apprentice, enabling original illustrations.

Second was Supergraph from Jamie Clark at Katikati College, whose sophisticated programming abilities were apparent in this graphical simulation of abstract mathematical concepts as commonly grappled with in the study of algebraic formulae.

Entertainment

The entertainment category is becoming more closely related to the educational abilities of computers, and this year's entertainment winner was Jigsaw, a game easily adaptible to educational mix-and-match exercises.

By Castle Software, it splits an Apple II screen in two parts, one side presenting mixed pieces, the other side an empty grid, and moving between the two a hand which can select and rotate the pieces.

Again the control of graphic effects was stunning. Second was a flight simulator for the Sega, by T. Johnson, and third, a collection of compulsive Commodore games by Mark Sibley.

Farming

In the farming category first place was awarded to a pasture farm management system adjudged "ahead of its time".

Gropas' developer, Dr John Bircham, of Hamilton, launched into this project armed with a strong faith in the potential of this type of farming aid, and had left the comforts and prestige as a former researcher with the Ministry of Agriculture and Fisheries.

Gropas is applicable to any farming situation in New Zealand, excepting predominant tussock country, and draws on a database holding average weather patterns, and the interactive effects of pasture slope, aspect, grass types, soil types and other factors.

The farmer's own input is by way of simple menu choices.

Part two of the package is a feed-

P.O. Minister Jonathan Hunt

budget – a database of stock requirements under varying feed conditions.

Business

In the business sector accounting packages were predominant.

The judges however picked on two non-accounting packages as prize-winners, presumably because they did not see new developments in the accounting software apart from adaptations to handle GST.

They were impressed with Profax, similar to CBA in using Dataflex, and well documented.

But the two business packages singled out were the retail stock control package from Irdoss, and the costing system from Soft-Tech.

Irdoss enables cash terminals to interact with a computer-held database and this system is continually up-dating inventories on the basis of each cash sale.

Irdoss was runner-up in the business category.

Small branch organisations here and in Australia using Irdoss have the ability to monitor sales.

But even more innovative was an aluminium joinery costing system from Hamilton.

It holds data on aluminium design standards, cutting designs, and other formulae, as well as unit costings of raw materials and other input.

Again the development began in "a garage", but fortunately the authors – David Price, Rex Doran and Sebastion Gourmet – were discovered by an AHI engineer checking rumours of such development underway. The result was AHI's initial purchase of 26 of the joinery costing packages.

This software presents the classic case of making the computer, in this case a Wang PC with hard-drive, an essential tool in an area where previously there was no application for a computer – apart from administrative functions.

The joiners can now present instant quotes, tailor margins for more competitive tenders, plan cutting schedules to minimise wastage and meet cartage schedules, and eliminate previously frequent errors in meeting variations in regional building codes.

Soft-Tech's David Price.

Compaq launch

Compaq Australia is to establish at least four more dealers, in main centres, following on from its recent launch of Scollay Computers as its Wellington dealer.

The next Compaq dealership is to be set up in Auckland.

Compaq claims it will win the second-time buyers of PCs, because of allegedly superior hardware and ongoing service from Compaq and its dealers.

'Intelligence' is looking for buyers

by Steven Searle

The big software companies are getting bigger and the small are... trying to survive, according to this year's keynote speaker at the New Zealand Personal Computer Software Awards presentation.

Wendy Woods, the founder of an online news service called Newsbytes, which covers the US, Europe and Japan computer industries, told the awards audience that today's buyer (users) are not like the hobbyists, hackers and experimenters of yesterday, but instead sought only to race through specific job tasks on their computers.

"They are stubborn in their loyalty to the tried and tested software, and are not actively looking for more sophisticated options."

Wendy's view of this trend is based not only on her Newsbyte sources in the US, England and Japan, but also as the result of research for two computer-related series she presents to US television audiences.

She told guests at the software awards, co-sponsored by Bits and Bytes and the NZ Post Office, that the software industry was risky – overall sales grew by about 20 percent last year, which was a lot less than previous years' rates of growth, and two-thirds of global sales were within just the top 10 software companies.

The affect on smaller developers of software is that they are looking to join larger competitors in return for marketing muscle, or are remaining independent but banding together into co-operatives where marketing costs are less burdensome.

"In the latter case, in my area of California a dozen software companies have banded together into a co-operative which enables sharing of mailing

lists and marketing strategies, and a newsletter-type flier direct-mailed to 100,000 potential customers.

"They are kitchen-table companies, and they are finding ways to by-pass conventional retail outlets."

Mergers

The other trend, of seeking big-brother support, is apparent in the 203 mergers of software companies last year – this year 300 mergers are predicted.

"Owners of small software firms are willing to sell-out because of the continuing slump in the computer industry."

Among the big buyers of this "software intelligence" are banks, publishers, investment companies and industrialists, and, of course, the large, publicly-listed software companies which hope to grow by acquisition.

An example of intelligence shopping is Apple Computer and its US$20m fund for encouraging third-party development of software (for Apple), mainly in graphics, telecommunications, artificial intelligence, video and compact-disc technology.

Daring methods

Wendy Woods said another effect of a tightened software market daring innovation in marketing techniques.

For instance, pint-sized Brown Bag Software put trial-size demo-discs as a lift-out insert into 350,000 copies of PC Magazine – and later direct-mailed the complete product to buyers.

Others are more extreme, as in direct-mailing free copies of new product in the hope of seeding a targetted market category with enough copies to hopefully generate further buying interest.

An example is Microrim in Washington, which seeded accountancies with its R:Base 5000 database. What is more surprising is Microrim's result – for every free copy seeded, it claimed eight units were actually sold.

Direct reach

Larger software companies have caught the trend and have initiated their own direct-reach campaigns, commonly by having their own sales staff directly approach corporations with bulk purchase deals more appealing than deals traditionally sought through mail-order discount houses.

An extension of this is "site licensing", enabling a client-company to freely copy programmes for employees' use. This tactic was initiated only a year ago, but now almost all the larger software producers are offering site licensing deals.

Keynote speaker: Wendy Woods.

Another outlet is through value-added-resellers (vars) who are encouraged to tailor programmes to client's specific needs, and such liaisons are becoming very popular.

Wendy Woods says the retailer, who has been left out of the new tactics, continues to be the mmain outlet and still account for half of total software sales.

The retail trend countering direct selling is basically that the big are getting bigger – four retail chains now own more than 100 stores each and are persistently prowling for more sites.

Dictate range

These big four dictate what gets on the shop shelf, and have the leverage to effectively close-out software for Apple and those other computer brands not stocked by these chains. In fact, they all carry IBM and Compaq stock, two carry AT&T as well, and one also carries Hewlett-Packard.

"It will affect software producers and the buying public in the same way that record producers battle radio stations ofr air-play, but listeners getting to hear only what the large stations will play," said Wendy.

Such a monopoly of outlets will ultimately tame pricing, but for the moment pricing of software is cut-throat, although stabilised, and in two broad categories – over US$400 ($800), and less than US$200 ($400).

Two courses

Wendy sees this split remaining because of the two main marketing courses of either costly and glossy marketing or low-cost, budget-conscious offerings.

The former also have expensive copy protection and litigatory back-up.

Such additional costs, she claims, cannot be readily justified by either the abilities of most big-name products, nor associated support which is claimed to be available.

However, there are some new products coming through despite the clamour and crowding – predominantly those products relating to specific types of users. For example, desktop publishing and telecommunications packages are two of the fastest growing market categories.

"But the bankable glory will go to those who can build on these innovations, rather than those kitchen-table companies who conceived 'the brilliant idea'," said Wendy.

Education society "policy"

The "draft policy" of the NZ Computer Education Society which was recently handed to the Cabinet committee on education, is now being circulated for comment among society members.

The Auckland group, one of eight branches of the society, was looking at the draft on May 19.

The society vice-president, Ken Mount, told Bits and Bytes that the draft was presented by one of its co-authors, Ian Mitchell.

"Apparently the Cabinet committee showed interest in our draft document and are wanting to see it again in its final form," said Mount.

But, said Mount, all members of the society would have opportunity to comment on such a policy statement before it is formally presented to the Cabinet committee as a submission of the Computer Education Society.

Draw winner

The lucky draw at PC86 in Auckland, for a computer desk, donated by Commodore Computer NZ, was won by: S. Moore, of St Johns, Auckland.

Come clean, says Ashton

The distributor of Ashton Tate Software, Arcom Paicific, is changing its trading name to Ashton Tate NZ Ltd.

Ashton Tate also announced an "amnesty" for current users of directly imported copies of dBase and Framework – if they come clean and buy upgrades currently on offer for these products, through the appointed distributor (Ashton Tate NZ).

The name change follows significant shareholding being taken in Arcom by Ashton Tate Australia Ltd.

The Australian arm of the US software producer was established last year to make Ashton Tate more prominent in the Pacific markets.

Ashton Tate (not a real person) distributes dBase and Framework.

The name change ceremony was in Auckland late last month and included the launching of Javelin, a new financial modelling and analysis tool riding high in the US.

It enables objective forecasting, and will be reviewed in Bits and Bytes.

Computerphone for sale?

The Post Office Telecommunications Division is offering a new deal to Computerphone customers.

A single payment lease is now offered, at $4995 for the basic system, for a period of five years.

It is an unwritten clause that after the five years lease ends, then ...

One assumes that the Act which limits Post Office trading, and prevents it from actually selling equipment, will ultimately be changed in accordance with the reality of market practices.

H.p. package

A low cost hire purchase accounting package from Thames Computer Services, formerly running on Commodore computers, can now run on most computers using MS-DOS 2.

It's not designed for billing or demand letters.

TCS has also written debtors, creditors and cashbook programmes to run on the Commodore C64 using a single disc drive.

IBM cracks down on clone

Computer Imports Ltd, the Auckland importer of Sigma and XEL micros, was (at time of deadline) to appeal against an interim injunction brought successfully by IBM NZ to stop the importer from further trading of XELs.

IBM also seized three of the XEL XT micros from Computer Imports as per a High Court order.

The basis of the action was an alleged infringment of copyright regarding the IBM XT's cabinet and BIOS (basic-input-output-system).

The appeal case was to be heard in Auckland on May 29.

IBM NZ chairman Basil Logan told Bits and Bytes that "IBM intends to pursue vigorously the means to protect its intellectual property".

"I am not saying there are others (infringing copyrights of IBM) but this litigation is evidence of our determination to protect our property," he said.

Logan said similar and recent action had also been taken by IBM against companies in Taiwan and Canada.

First impressions of the Amiga

by Noel Doughty

In this article I shall discuss some of the basic features of the Amiga Personal Computer released in New Zealand at the PC 86 Exhibition in Auckland on 8, 9 and 10 May. I shall give a physical description of the computer, including some of its specifications and pricing, a little on the iconic Workbench user interface and its demonstration software, supply a short guide to the recent articles on the Amiga and outline some obvious directions that the evolution of the Commodore 68000 and 68020/68881 PC units could take in the near future.

I shall leave till later the details of the AmigaDOS operating system, the languages, the software and the medium to top-end options that will be possible as a consequence of the ready expandibility of the Amiga architecture. It is, however, precisely these options, and what they offer along the road to friendly mainframe type power on the desktop, at a reasonable price, that has created the considerable interest in the Commodore Amiga 68020/68881 family and its direct competitors, such as those from Atari.

Indeed, it is this very interest, not only for home, business and industry use, but also especially in education and research, that has led to the review whose first stages are being reported here.

The bundled unit

The Amiga 1000 PC unit being released in New Zealand has its minimum RAM (Random Access Memory with read-write capacity) extended to 512 KB by an internal 256 KB RAM card, mounted behind an easily detachable front-centre panel.

It has one internal 880 KB (formatted) 3.5 inch built-in disk drive, arrives with the Amiga two-button mouse and with an Amiga RGB monitor.

The unit being reviewed has, externally, a second 3.5 inch drive. The accompanying system developer's kit comprises 26 disks and 7 kg of manuals totalling about 2000 pages. Only one 3.5 inch drive can be installed internally.

This single-disk unit with 512 KB, will be the standard version sold in NZ.

The main unit will not be sold without the RGB monitor.

All three external drives may be for microdisks, or alternatively, 5.25 inch IBM PC format drives.

Although this will not affect their use with the RGB monitor, since it will be bundled in the NZ sales, these units will initially be NTSC composite video versions.

The European and Australasian composite TV video version, conforming to PAL is being produced in Germany and is scheduled for NZ release in September 1986. A kit may later be available (from Commodore) for conversion from NTSC to PAL, for those, probably very few, with PAL cameras and similar accessories, that might be affected by the difference.

Other examples could be in the specialized mixing of external composite video signals to the computer's own video output via the AMIGA GENLOCK or the capturing and digitizing of external signals in Amiga itself with the AMIGA LIVE DIGITIZER, formerly known as the "frame grabber" (References: 1,10). Subject to FCC approval (US Federal Communications Commission), each is expected to be released in May and each is to sell for about US$250.

Compact keyboard

The Amiga is nicely tailored.

The whole unit is easier to lug about than an IBM PC but clearly somewhat less so than the Macintosh or even the Apple IIe, and similar PCs, which typically have a hand-grip on the monitor.

It is noteworthy that the Amiga is the first of the higher-powered micros for which I have not immediately noticed the noise of the fan.

After being accustomed to a 97-key style KB-5151 keyboard with separate pads, the Amiga keyboard looked, miniscule.

Indeed, it slides neatly under the small processor when not in use.

The keyboard cable is channelled under the processor causing no cluttering of the work-table. This is important if operating with the mouse and also since peripherals will all be external.

However, many of the latter may be stacked vertically, off the table, in compact side-cars on the right-top side of the processor.

Despite its apparent small size the keyboard has 89 adequately spaced out keys including 10 function keys across the top, a full 13-key data pad on the right and a separate set of 4 cursor keys on the lower right of the typing keys.

It can easily be moved over a metre from the main unit.

I like the feel of the keys although some users consider them spongy or too light with insufficient slope-up. I found their layout well-designed with large well-placed SHIFT, TAB, RETURN, BACKSPACE and data ENTER keys.

Starting up

Plugging in and firing up the Amiga is a piece of cake with or without the very readable documentation in the User's Guide.

My cable from Amiga to printer was delayed on arrival of the unit just before Easter. However, the documentation in the User's guide and printer manual was perfectly adequate, even for someone like myself, with only rudimentary wiring and soldering skills, to make up a temporary printer cable with connectors and hook-up wire.

The plugs and sockets are designed, at the expense of minor departure from standards, to mate only in the correct combination.

Amiga responds after a few seconds with an icon (image-oriented) request for the first system disk, Kickstart (Version 1.1) whose information is loaded into a special 256 KB of RAM.

This is then made non-writeable, behaving essentially like ROM (Read Only Memory). This Kickstart system RAM is independent of the 512 KB available to the user and opens up the possibility of eventually emulating an almost unlimited variety of other machines.

The IBM PC is the most obvious (see below) but Commodore 64 and Apple II emulation are both rumoured to be on the way.

The user is then prompted for the second system disk, Workbench (5). If used as supplied, this boots the system automatically through the Amiga's UNIX-like Disk Operating System (AmigaDOS) to the very friendly image-oriented Macintosh-like (mouse or keyboard operated) Workbench interface. (An Amiga with a standard Unix operating system has been suggested as the next step, especially as there is always resistance to a new non-standard operating system. There is also less than complete satisfaction with AmigaDOS: see Ref. 18.)

From the Workbench one has access to the CLI (Command Line Interpreter) of AmigaDOS. One also has the choice of by-passing the Workbench completely and going straight to the CLI, much more familiar to a non-iconic user.

This multi-level user interface (called Intuition), giving each user the choice of mode of operation, is another excellent feature of the Amiga.

The quality of the Amiga's colour graphics, animations (and sound) is breathtaking. The lowest resolution (320 x 200 pixels) permits 32 colours while high resolution (640 x 400) gives 16, chosen from a palette of 4096 hues.

The Amiga's HAM (hold and modify) colour graphics mode gives still pictures difficult to distinguish from the very best TV.

I had heard a great deal about the high-resolution colour graphics on the latest 68000 computers. I was also quite accustomed to the excellent visual quality of monochrome graphics and text at 720 x 348 pixels with a Hercules-driven IBM PC compatible.

I was therefore ready to be very impressed with similar quality in colour on the Amiga. However, I found some of the text on the Amiga Workbench, although in colour, to be not in its highest resolution. This was a surprise and a disappointment.

I would find it difficult to word-process my scientific papers for long sessions with a text screen any poorer than 640 x 400.

Unfortunately, I could not find the choice of high-resolution monochrome for text. This apart, the range of video outputs on the Amiga far exceeds those of its competitors, especially with the Commodore Genlock option (1) for mixing with signals from TV, camera, video cassette recorder or laser disk.

The Atari is reputed to be a little better on text resolution.

For one excellent detailed comparison of Amiga, Macintosh and Atari 520 ST, consult Webster (18), 68000 WARS : ROUND 1. Others are available in References 13 to 16. However, "low" is certainly a relative term.

The Amiga, even in low-resolution mode, is much sharper by far than the Commodore 64s and 128s or an IBM PC compatible with colourgraphic screen. Most standard printers are available immediately by selection from the preferences on the Workbench.

These include Epson, HP laserjet, HP Laserjet Plus and at least two colour printers.

One is the moderately priced Okimate 20 which (for about NZ$700) gives very satisfactory results.

Another is the Diablo C-150 (Gracely, Jim Commodore Powerplay Feb/Mar 86, 72-75) capable of first-class colour printing appropriate to graphic design studios (approximately US$1300).

Workbench demos

Despite some obvious advantages of mice in certain situations, I had not, until the Amiga, been much taken by them and less so by icons. I had found the CLI and knew I could go back to it when ready for what I might consider to be "more advanced" uses.

I therefore gritted my teeth, read as little as possible of the User's Guide, went straight into mouse operation of the Workbench Demos and I soon had a ball! A colourful, noisy, rotating, bouncing ball: Boing!

Disconnect the Y-adaptor linking the two stereo phono jacks to the single-channel speaker in the RGB monitor, reconnect them to your stereo unit, experiment with clicking on your choices from the Workbench Demos disk and within moments you can be exploring all the options and menus with ease.

I soon had a view of Boing forming on the rear screen with the Workbench in front. A short time later I had noisy stereo Boinging in the background behind a half view of the Workbench, with carefully re-arranged icons, and high-speed, high-resolution colour animation in the form of Fields (or Molly) in the foreground.

Then, with Fields, Workbench and Boing still displayed, I got Amiga to run through her delightful speech capabilities layered over the sound of Boing still busy in the background, but slower.

Full text to speech software, not only on words but also via phonemes, comes with the Amiga.

The Commodore Amiga 1000 PC

The various tasks share the use of the main processor, and its three specialized custom chips, and each will therefore be slowed down.

I was, in fact, enjoying a playful use of one of Amiga's greatest qualities, its multitasking. In that example I was only left with 30-odd KB of RAM.

Adding more tasks is asking for a crash. But RAM is coming down in price all the time. And the Amiga has incredible expandability, another of its great assets. RAM may be extended to a massive 8.5 MB compared with 4 MB for the monochrome Macintosh Plus (I believe the Recommended Retail Price is $5995).

Only the Amiga has the multitasking and this feature can scarcely be added to the others without, in essence, total redesign, ab initio.

One needs to experience multitasking (9) and then have to go back to working without the advantages of simultaneous, or at least immediately accessible, sorting, printing, word-processing, number-crunching or anything else, like sending or collecting electronic mail, to appreciate the immense advantages it can bring.

These same advantages will extend to the use of Amiga in education and for high-powered research applications where lengthy programs can be left going in the background and still leave the computer available for other work. And surely, its not such a great step

from multitasking to multi-users on a micro.

The Workbench comes with a line editor (EDIT) and a full-screen editor (ED). A tip on exiting from the Mandrill Demo: Position the centre, not the tip, of the pointer on the dot of its Close Gadget.

IBM emulation

With at least one Amiga 5.25 inch drive (or availability and handling facilities for IBM PC software on microdisks) one can make use of the Amiga emulator programme (6, 8, 12, 17), now often called The Transformer, supposedly released (12) in the US last week.

Keep in mind that I am writing this to a dead-line of the first week in May. It is expected that the transformer will be available here in NZ almost immediately but there are still some doubts about the precise release date.

However, it transforms the Amiga to permit it to read and write IBM PC compatible disks (6). Commodore utilities will interconvert AmigaDOS files and PC or MS DOS files.

The transformer can also run with 3.5 inch drives provided you have a programme to format all 80 tracks if you wish to make use of the full capacity.

IBM FORMAT and DISKCOPY work, on the transformer, with either type drive. Some programmes (18 out of 20 leading products, so far) known to work on the current release include Lotus 123, dB II, dBIII, Fancy Font, Symphony, and Crosstalk XVI (which makes heavy use of interrupts). dBIII+ wasn't mentioned.

The transformer runs PC software 30 to 50% slower than IBM PC compatibles. (See Mark James' review – Ed.)

It should be regarded as a safety cushion or a security blanket, important to many and especially crucial in business.

It appears to be one of the most attractive features that Amiga has to offer. However, graphics programmes may need more than just the software transformer.

Programmes that need highlight by flashing (e.g. Multimate) may not even be supported on the current transformer release. (They were not on version 3.7).

However, it should permit an enormous number of users to gradually pull themselves over to the Amiga version of modern technology, if they so wish.

And with less likelihood of a lengthy non-productive phase during the period when thoroughly debugged and powerful software is hard to get, as is always the case with new machines.

The emulator sells in the US for US$200 and a further US$100 is believed to secure the accelerator card for the emulator.

It is understood that Commodore are working on a 4.77 MHz 8088 Sidecar that will run all PC software at full speed. It will also contain 2 MB of RAM expansion. Sidecar has three additional PC-compatible slots for extra RAM and a 20 MB hard disk usable by Amiga or PC-DOS software. The 68000 and 8088 chips canco-process in a hybrid state. Third-party hard disks and Ram expansion are already available from several manufacturers.

Turbo-Amigas

Computer System Associates (2,3) have manufactured a piggy-back board comprised of a 68020 main processor with a 6881 floating-point co-processor plus 512K bytes of 32 bit memory which they add to a stock Amiga and run at 14 MHz.

The result benchmarks (3) at 2250 drystones compared to 1500 for a VAX 11/780. The Mandlbrot demo takes 3 minutes compared with 50 on the standard Amiga 1000.

John C. Dvorak reports (4) that Commodore's new Amiga, "Ranger", based on the 68020 with a super-high resolution 1024 x 780 pixel display, is to be demonstrated in May, a few shipped in July and produced in numbers before the end of the year, selling, he believes, for about US$4500.

This may not appeal to the home user but should delight those needing CAD/CAM (Computer-Aided Design and Manufacture).

Spanning spectrum

The Amiga can apparently be applied to a great variety of types of computation. These include a top of the range home computer for accounts, word-processing and spectacular high-resolution games in colour.

The games are all in good resolution with sound.

Multi-instrument music synthesis in four independently programmable channels, which can be mixed in two stereo outputs, is available in software and via a MIDI interface (Musical Instrument Digital Interface) for controlling up to 16 separate devices such as synthesizers and digital drums.

In business, apart from IBM emulation, which appears to be a somewhat uncertain temporary measure, it has its own rapidly growing base of software, which should execute at very high speed, for more demanding accounting problems, costing, database and spreadsheets and sufficiently good resolution colour graphics for CAD.

It has most of the requirements of an excellent school computer.

It also has the potential (with and without peripherals) of a very powerful teaching and research tool in advanced education and research.

MCC Pascal by Metacomco is available but not highly regarded while Borland's TurboPascal for Amiga and three or four other Pascals are on their way.

'C' is already available from both Lattice and Aztec). Lattice have supplied cross-compilers which permit Amiga programmes to run or be prepared on VAX, UNIX-based and MS or PC-DOS systems. Modula-2 (TDI, UK) is available and will be much sought-after by software developers.

The much-praised AmigaBasic by Microsoft is bundled with the sale, replacing AbasiC (Metacomco) which is also available. Metacomco have implemented the so-called "articial intelligence" language, LISP, in the Cambridge version, opening the way to algebraic manipulation programs, such as REDUCE.

In fact, Amiga may find her greatest application as an alternative or replacement of computers like the Apple IIs and BBCs in the home, schools, polytechnic institutes, universities and industry rather than in straight business application where continued relatively straightforward use of standard packages predominates over innovative computing.

The Alpha and Amiga?

By home computer and small business standards, Amiga is not a low-budget computer, at a recommended retail price of $3995 (including monitor, two-button mouse and one disk drive), especially compared to the low prices, as little as $1900, for good quality Asian IBM PC compatibles of similar configuration, if not similar performance.

For the latter there is a great deal more very useful software, mostly very well debugged.

But the Amiga, in addition to IBM PC emulation, will certainly do a great deal more than an unimproved IBM PC compatible, and most of what it can do in common with the IBM PC, it will do much faster and with better resolution, especially in colour.

It is worth noting that Commodore US have recently (11) announced a massive reduction of US$500 off the price of the Amiga bundled as for the NZ sales, thus considerably reducing the price difference with the Atari ST, one of their principal competitors.

Commodore appear to have chosen the openess of the architecture of the Amiga, their latest release and a big step up, with a very careful eye to the future.

The big question is just where is Amiga to find her share of the market: in business? in the home? in education? or right across the range?

1. Bateman, Selby Compute! Apr 1986, 21-26 New Technologies: The Converging Digital Universe (Amiga's Genlock and AnserMate)
2. Byte Information Exchange Byte Feb 86, 363-372 Aiga Talk
3. Commodore, Soft. Dept. Amiga Mail Apr 86,3 Turbo-Amiga from Comp. Syst. Ass.
4. Dvorak, John C. InfoWorld 31 Mar 86 Commodore, Atari have New Micros on the Way
5. Gracely, Jim Commodore Powerplay Dec 85/Jan 86, 74-77 The Amiga Workbench
6. Graham, C. AmigaWorld Nov/Dec 85, 34-35 Amiga's Trump Card: IBM PC Emulation
7. Grantham, Tim TPUG Issue 22, Apr/May 86 14-16 Amiga Dispatches
8. Halfhill, Tom R. Compute! Oct 85 28-29 Amiga goes IBM-Compatible
9. Halfhill, Tom R. Compute! Apr 86, 6 Editors Notes (on Multitasking)
10. Leeds, Matthew AmigaWorld Mar/Apr 86, 26-32 Success Story: A-squared Systems and the Amiga Digitizer
11. Mace, Scott InfoWorld 31 Mar 86 Sales Promotion cuts US$500 off price of Amiga
12. Mace, Scott InfoWorld 7 Apr 86 Commodore's PC-DOS Emulator Ready to Ship
13. Mansfield, Richard Compute! Mar 86, 6 Editor's Notes (Comparing Atari's 520ST with Commodore's Amiga)
14. Meyer, Jim TPUG Issue 22, Apr/May 86 16 Amiga vs ATari ST
15. Pournelle, Jerry InfoWorld 14 Apr 86 West Coast Computer Faire: Amiga & Atari
16. Sugarman, Joseph Compute! Mar 86, 41 Atari explodes (Atari advert comparing Atari with Macintosh and Amiga)
17. Wallace, Louis R. Commodore Microcomputers, Nov/Dec 85, 74-77 Commodore Launches the Amiga: End of a Dream, Beginning of a Legend, Dawn of an Era.
18. Webster, Bruce Byte Mar 86, 305-322 68000 Wars: Round 1

MICROCOMPUTER SUMMARY

Name:	Commodore Amiga 1000 Personal Computer
Microprocessor:	Motorola MC68000, 32 bit internal bus; 16 bit data bus; plus 3 custom chips to control sound, graphics and peripheral input/output
Clock speed:	7.15 MHz
Power:	120-240 V, 60 Hz, 2amps.
ROM:	192 KB for graphics, sound, animation and multitasking
RAM:	Minimum 256 KB expanded in NZ internally (centre-front panel) to 512 KB and expandible externally via a 43-pin side slot to 8.5 MB
RAM (system)	256 KB for disk-based (Kickstart) operating system.
Monitor:	Amiga 1080 RGB analog and digital colour input, 33 cm (13in) diagonal.
Keyboard:	Detached 89-key, with 10 function keys, 13-key numeric pad, and 4 cursor keys. 8-key type-ahead buffer.
Graphics:	320 x 200 pixels, 32 colours 320 x 400 32 colours 640 x 200 16 colours 640 x 400 16 colours Hold and modify mode
Sound:	Four independently programmable channels, two per sterio channel
Operating System:	AmigaDOS (by Metacomco)
Languages:	AmigaBasiC (Microsoft), MCC Pascal (Metacomco), Lattice 'C', Aztec 'C', AbasiC (Metacomco), Camb LISP Modula-2 (TDI), Macro Assembler/Linker (Metacomco), Fortran 77 Compiler (ADA, Italy).
Built-in Disk Drive	Double-sided double-density 3.5 inch 880 KB (formatted) in 160 tracks, each with eleven 512-byte sectors, whole track read at a time. Max. Transfer rate of 250 K bits/sec. Power: DC 12 V 0.12 A / 5 V 0.22 A
User Interface:	Intuition; supports multitasking via virtual terminals; allows display of different resolutions simultaneously.
Disk port:	D-23 (female) for daisy-chaining 3 extra disk drives or tape streamer. Power: as for built-in drive.
Pointing device:	Two-button mouse, via D-9 (male) game controller side port
Bundled Software:	Kickstart, Workbench, AmigaExtras with Amiga Tutorial and AmigaBasiC, Kaleidoscope, Voice synthesis library.
Serial Port:	D-25 (female), 19.2 K baud maximum transfer rate.
Parellel:	D-25 (male), Centronics-compatible, reconfigurable.
Audio ports:	Two (female) RCA phono jacks for left and right stereo Signal to noise 70db, 20-6000Hz, less than 1% distortion; impedance 300 ohms
Video ports:	D-23 (male) RGB analogue and digital 7-pin (female) DIN NTSC RF for connecting to a TV US (female) phono jack for NTSC composite.
Games Ports	Two D-9 (male) ports on the side (one used for the mouse). Reconfigurable.
System Expansion Port	43-pin system bus edge connector for expansion chassis
Bundled Documentation	Introduction to Amiga; AmigaBasiC by Microsoft.
Optional extras	

External 3.5 or 5.25 inch disk drive, (W15.5 cm x H7.0 x D20.5, 1 kg)	NZ$795
Parallel printer cable (length 2.0 m):	NZ$98
NTSC to PAL conversion kit	NZ$300

Ratings (5 for highest):

Expandibility:	5	
Ease of Use:	5	
Documentation:	5	
Languages:		Not yet fully assessed
Support:		Not yet fully assessed
Value for money:		Not yet fully assessed

Review unit from Commodore Computer (NZ) Ltd.

AMIGA™ is here . . . .

and ASHBY COMPUTER CENTRE LTD is AMIGA™

STANDARD SYSTEM SPECIFICATIONS

512 K RAM – Expandable to over 8 MB.
KEYBOARD – 89 Keys.
DISK DRIVE – 3½" Micro Floppy. 880k formatted colour monitor, Commodore Model mouse, Basic Tutor, Kick start, and Kaleidoscope.

ONLY $3995 *COMPLETE*

EXTRA 3½" DRIVE ***$795***

WE ARE NEW ZEALANDS LARGEST commodore DEALERSHIP!

FIRST for specialised Knowledge, **FIRST** for service, **FIRST** for AMIGA

ASHBY COMPUTER CENTRE LTD

93 Ashby Ave,
St Heliers,
Auckland, Ph 588·301

To ASHBY COMPUTER CENTRE
93 ASHBY AVENUE
ST. HELIERS, AUCKLAND 5.

YES! I WANT AN AMIGA !
SEND FULL DETAILS ..... ☐
RECORD MY ORDER ..... ☐
EXTRA DRIVE REQUIRED ..... ☐
NAME: .....
ADDRESS: .....
..... *PHONE:* .....

AMIGA: a ground-breaker

by Mark James

New computers, in order to be successful, have to do one of two things: either they must provide something absolutely new, or else they must provide something old and established, but at a better price. For the past couple of years, very little has appeared that could be called new; but now there is the Amiga.

The Commodore Amiga is a computer that has the feel of history being made, like the Osborne 1 or the Apple Lisa.

Since its American introduction last August, it has already had a significant effect on the industry, and will no doubt greatly shape the next generation of home computers.

The Amiga itself might, as a business venture, succeed or fail; but its influence on the world of computing will remain incontestable.

The New Zealand version of the Amiga was finally released at PC86 last month. This review, however, is based on the American model, a copy of which was kindly provided for the purpose by Commodore Computer (NZ) Ltd.

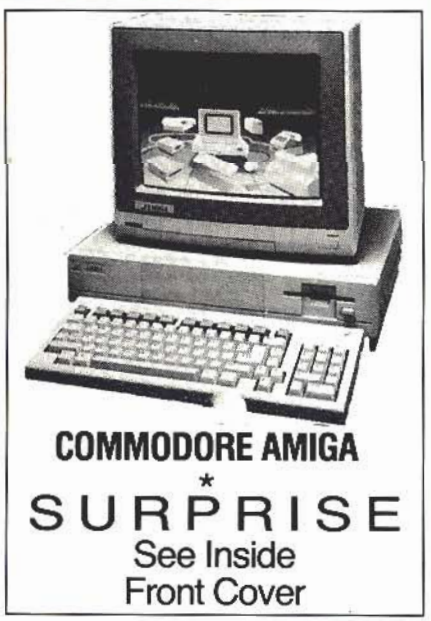
From the outside, the Amiga looks much like an IBM PC clone: a long, low plastic box, a detachable, 89-key keyboard, and a colour monitor. There is a single 3 ½-inch floppy disk drive in the front, two mouse (or joystick) ports on the right side, and a row of connectors in the back for serial and parallel interfaces, an external disk drive (up to three of these may be daisy-chained), audio outlets for four-channel stereo sound, and a choice of three video outputs: digital RGB, radio-frequency, and composite.

The radio-frequency port, unfortunately, uses only the American NTSC standard, and will therefore be useless to New Zealand television sets, which run on the PAL standard. A PAL version of the Amiga is promised for this winter.

When booted up, the Amiga's interaction with the user resembles that of the Apple Macintosh, except, of course, that the Amiga is in colour. Icons appear in windows on the screen, along with a diagonal pointer that is moved about with the mouse. Icons are selected and "opened" by clicking one of the mouse buttons, while the other button causes menus to pop down from the top line.

The mouse has control over the size, position and priority of the windows. Any number of windows may be open and active at once (the limit being the computer's memory); the operating system is completely multi-tasking.

For those who prefer the traditional command-line interface (as with CP/M or MS-DOS), this is available as a clickable icon; a window appears, and you can type in AmigaDOS commands. We shall return to AmigaDOS later.



Inside Amiga

On the inside, however, the Amiga is radically different from any other computer. In addition to its central processor, a Motorola 68000 chip, there are three other processor chips designed specifically for the Amiga; these take care of specialty functions such as graphics animation and sound generation.

As a result, the graphics quality is unrivalled by anything other than a dedicated CAD/CAM system, and the sound generating capabilities are the equal of most music computers. Each of these features is worth a closer look.

The Amiga supports five different graphics modes. The lowest resolution is 320 by 200 pixels (the same as IBM's low resolution) and 32 colours; the highest is 640 by 400 pixels in 16 colours. However, the limitation to the number of colours is really only formal.

The palette (16 or 32) colours may be chosen from a selection of 4096 colours; not only that, but the display can change its palette in the middle of a screen, so that it is possible to have all 4096 colours on the screen at one time.

This allows for a level of realism not possible in other personal computer displays.

One of the Amiga's special chips, called the "blitter", has as its sole function the massaging of the video memory.

It moves images, sprites and sprite-like objects around, and combines information from various sources to form a single video image. Since it can operate independently from the central 68000 processor, windowing and animation are extremely efficient on the Amiga. The animation demonstrations, in fact, are better than some television cartoon programs.

The Amiga comes with a demonstration diskette called "Kaleidoscope", from Electronic Arts. This contains, in addition to a boring sales slide-show, a magnificent set of ten pattern generators which run the blitter at full throttle, and are likely to do the same to an unprepared brain.

In my opinion, pattern 4 alone would nearly justify the cost of an Amiga.

The quality of the graphics and animation are due not only to the specialty hardware, but also to the sophisticated operating system routines that have been standardised and coded into the Amiga's ROM.

These routines are accessible to user-written programs, so that animations and games should be fairly easy to create.

The documentation on how to do this, however, consists of two massive manuals; only the devout hacker is likely to survive an encounter with them.

Sound

The sound capabilities of the Amiga are nothing short of astounding. To one accustomed to the pale three-voice sound chip of the MSX machines, it was rather unnerving to walk into a room and hear the Amiga playing Bach's "Jesu, Joy of Man's Desiring" on a harpsichord and cello.

A friend of mine, who can sight-read music, had "composed" it in twenty minutes, using a demonstration Musicraft package that had come with the machine. He had simply used the mouse to paste the appropriate notes on to a musical scale.

The Musicraft package includes several dozen synthesised instruments, from classical to heavy metal.

With some quick changes to the instrument and tempo settings, we had Bach's gentle melody under assault by a cross between Jean-Michel Jarre and the ghost of Jimi Hendrix.

Elsewhere, we converted a flute into a World War II airplane engine by tweaking its synthesiser characteristics.

This is not your typical music program.

A talker

The most striking of the Amiga's features, however, is its voice synthesis.

AmigaDOS includes the command SAY.

I didn't know what it did, so I typed SAY GOODNIGHT, DICK. "Goodnight, Dick" said the Amiga, in a voice, well, no worse than a telephone recording.

SAY I AM A STUPID COMPUTER. "I am a stupid computer," said the Amiga, with an accent that must be described as midwestern American. The computer can speak in various pitches of male and female voices, and in monotone or modulated speech.

Sentence intonation in the modulated speech is surprisingly good.

The possibilities are both endless and obscene. We discovered that the SAY command can read text from a file on disk, so we told it to read us the Lattice C language manual.

It did. It made lots of mistakes (for example, the word "Lattice" rhymed with "that ice"); but it was nearly all understandable.

If you imbedded pitch control command in the text, you can actually get the Amiga to sing.

The Amiga converts text to speech in two stages. First, it translates the written words into a phonetic representation; then it calls a routine that converts this phonetic transcription into sound. In theory, then, to make the Amiga speak any language other than English, only the first step need be modified.

As with the animation and music modules, speech synthesis is done in ROM routines callable from user programs. For example, Amiga BASIC has two speech instructions: B$= TRANSLATE(A$) converts an English text string A$ into a phonetic string B$; and NARRATE(B$) feeds the phonetic string to the sound generator. Talkiing BASIC programs are thus very easy to write.

The graphics, animation, music, and voice capabilities of the Amiga are theoretically possible on any computer. The Amiga, however, has implemented them as standard features of its operating system; it has even gone so far as to incorporate special processors to handle them efficiently, removing a great burden from the central 68000 chip.

One other special feature of the Amiga deserves mention. This is the IBM PC emulator.

Since its hardware and its operating system are both such radical departures from traditional micros, the developers of the Amiga apparently decided to build a bridge to the IBM world, with its vast array of accepted software.

This was no mean task.

The IBM PC uses a completely different microprocessor and ROM BIOS routines. A program would have to be written, probably in 68000 assembly language, to interpret the assembly language of the Intel 8088 chip.

Then all of IBM's ROM routines would have to be imitated. All of this was actually done, and the result is called the Amiga Transformer.

The Amiga Transformer is a very impressive piece of software engineering, and almost completely useless.

It is impressive because it does nearly everything that is promises to do; most IBM PC programs will in fact run under the Transformer.

However, they run at less than one-tenth the speed. Generic WordStar, for example, took one minute and four seconds to reform a ten-line paragraph.

AMPS, which boots in less than ten seconds on an IBM PC, took nearly two minutes on the Amiga.

A program to calculate prime numbers between 1 and 1000 took 15.1 seconds; it takes 1.5 on the IBM PC.

In addition, there are some annoying bugs in the Transformer. The serial and parallel ports work in polled mode, but not in interrupt mode.

The Transformer will format and use 3½-inch diskettes, but they cannot be read on an IBM PC/JX, or any other machine, to my knowledge.

In spite of the Amiga's abundant colour, IBM colour does not work under the Transformer; neither do bright and dim displays. The Transformer runs PC-DOS 3.1 much better than 2.1; in the latter, any message that includes "Abort, Retry, Ignore" or "Press any key to continue" kills the Amiga.

There were a few other disappointments with the Amiga as well. On-line help, for example, is limited, and almost non-existent in the icon screens.

With the powerful graphics interface routines available, it should not have been difficult to include a "Help" menu for most screens, describing to the novice just what is going on.

AmigaDOS, although it seems a very powerful system, lacks such good-sense features as memory-resident commands and text printing. (You have to COPY textfile TO PRT:, and there are no options as to how it comes out.)

If you happen to be using a disk that does not have a DIR command in its directory, then there is no way to find out what commands are available to you.

These problems, however, are soluble; in fact, one suspects that they are very easily soluble, given the fine tools that the Amiga does have, and the obvious thought and effort that have already gone into this ground-breaking computer.

Reviewer's Ratings: (1=low, 5=high): Documentation 3; Ease of use 4; Language 4; Features 5; Value for money 4.

Options:

Printers, $995 to $2695
External 3½" diskette drive, $795
External 4¼ diskette drive
External hard disk
Expansion box
MIDI interface

"We decided on PROFAX because it gave us the most cost effective solution to streamlining our accounting system."

Mr Robert B. Mackeley,
Managing Director,
Active Components Ltd.

"As an importer of a vast range of electronic componentry, we recently evaluated several brands of fully integrated accounting software for our company."

"With little hesitation we decided on PROFAX. We found PROFAX easy to install and with little training our staff find PROFAX very simple to use in day to day operations."

PROFAX is the new, easy to use, accounting system designed in New Zealand to meet the real needs of the small business.

PROFAX is completely integrated to handle all your necessary accounting in one.

Accounts Receivable (Debtors Ledger)
Accounts Payable (Creditors Ledger)
Invoicing/Sales Analysis
Inventory Control (Stock Control)
General Ledger.

Other PROFAX features include:

Comprehensive, easy to follow manual • easy to read screen layout • on screen editing to eliminate errors • immediate selection of options • simple extraction of information for budgeting • no loss of essential data through power failure • handles GST in an efficient way • designed to run on IBM PC, XT and compatible computers.

Ask your local computer retailer to show you PROFAX. Put it side by side with any other accounting system and you will see the difference. Or, if you prefer, send in the coupon for more information.

PROFAX

SMALL BUSINESS ACCOUNTING SYSTEM

Designed and marketed in N.Z. by Logical Methods Ltd.

For a free copy of our brochure and for further information, call Auckland 398 105. Or, clip and post this coupon.

To: PROFAX
Logical Methods Ltd,
P O Box 37-623,
AUCKLAND.

NAME: _____

COMPANY: _____

ADDRESS: _____

Ph _____ LM861-B&B

VP-Planner = David & Goliath time for Lotus?

by Richard Gorham

In that corner of the software publishing arena reserved for the elder-statesmen of the micro-computer revolution, there has up to now been one supreme champion – the remarkably successful LOTUS 1-2-3.

LOTUS 1-2-3 has arguably been the single most innovative and polished software produce involved in making people recognise and realise the potential of the personal computer – without having to become programmers in the progress.

1-2-3 has enjoyed a lengthy lead in the packaged software market by providing a quality product which set new standards in the areas of the user-interface (emulated by countless other packages since), interactive tutorials, documentation, and sheer speed of operation.

The capabilities of packaged software has progressed rapidly with the startling growth of personal computer usage, and Lotus Development Corp has maintained some of its flead with subsequent packages like Symphony, and the recently released upgrade to LOTUS.

However signs of increased attack on this supremacy have been seen in recent times and VP-Planner, a veritable Lotus 1-2-3 clone from Adam Osborne's Paperback Software International (PSI), makes no bones about the fact that it is a direct challenger to Lotus 1-2-3.

Lotus is hardly likely to welcome this newcomer.

Big target

Given that the market for spreadsheets for corporate, small business, and single user is the largest single target audience of PC software, then Paperback Software would do well to prepare for what will likely be a lengthy toe-to-toe slogging match with Lotus.

This should be a good thing for the end-user who could well be the eventual winner by way of faster, more powerful, and cheaper software.

Preliminary reports from overseas suggest that VP-Planner is a formidable first salvo from PSI, already causing some concern to Lotus.

With a price tag of only NZ$259 (as against Lotus' 1-2-3's $1280) it's easy to see why.

The VP-Planner package comprises a large (you guessed it) paperback manual, which contains a stiff cardboard envelope that forms the rear cover of the manual and acts as a sealed puch for the single program diskette and sample data diskette.

The presentation of the manual is very good, with clear diagrams and screen samples.

The manual does not however make any real attempt to describe spreadsheet theory, and instead recommends the purchaser to obtain a copy of one of the many independent reference books on Lotus 1-2-3 for both beginners and advanced users (several are listed).

Beginners would be well advised to heed these comments if they are to extract full potential from the package.

Instead of providing a comprehensive beginner's guide, more time has been spent describing the differences between Lotus 1-2-3 and VP-Planner, and the extended VP-Planner features like dBase file acess, and multi-dimensional spreadsheets.

Sample spreadsheets are provided on diskette and the manual refers to these in it's tutorials on the newer features, giving the reader the option of entering data from scratch or using the sample data provided (the lazy way out for experienced spreadsheet users).

The samples are well thought out with explanations of the more abstract concepts presented with helpful diagrams and analogies.

Copy-protection

The program-disk itself is copy-protected and must be present as a key disk at all times even if the software is loaded down to a hard disk.

However, registered users can obtain a non-copy-protected version by signing and returning a pre-printed single-user license agreement (and US$10) to the supplier. This seemed to me to be a rather eleborate way to get the user to sign an agreement – and did lead me to wonder whether by implication that if you can crack the copy-protection scheme you are not breaking any agreements?

The program requires a minimum of 256K (in contrast to Lotus 1-2-3 Rel 1A's 192K requirement) and DOS 2.0 upwards to run. Use of some of the extended multi-dimensional spreadsheet capabilities require a minimum of 320K.

System memory up to 640K will be accessed by the program, extended memory boards (for over 640K) are not yet handled by the program, but it is most likely that they will be in a subsequent release.

The program is claimed to run with co-resident packages such as Sidekick, Superkey, and Mouse-driver software.

No installation process is required: you simply load the program disk and type "VP".

Presumably hard disk users will want to take advantage of the "path for files" option from the main menu, and other system default options to tailor the file retrieval and storage to their own requirements.

Lotus compatibility

Dealing with the obvious comparison between LOTUS 1-2-3 and VP- Planner firstly, the initial question from most people will inevitably be "Just how compatible is it with Lotus 1-2-3..?...

The answer to this is simple – totally compatible with Lotus Relase 1A in terms of using Lotus 1-2-3 developed spreadsheets and macros in VP-Planner.

This is also true in the reverse; i.e. utilising VP-Planner spreadsheets and macros in Lotus 1-2-3 – providing none of VP-Planner's extra features (such as auto-key macros, multi-dimensional spreadsheets, dBase file accesses etc) are utilised.

Lotus 1-2-3 version 2 and Symphony files can be read if their file extension is renamed to .WKS, but if there are any cell formats, functions, or commands in these worksheets not available in VP-Planner then errors (ranging from "soft" error-messages to system crashes requiring re-boot) may occur when running these spreadsheets.

Differences

Spreadsheet screen layout is very similar to Lotus rel 1A, but with command menus being shown at the bottom of screen (rather than top as in LOTUS) and with these options being selectable by means of function keys as well.

A number of useful extra facilities (over Lotus rel 1A) are provided for standard spreadsheet usage:

1. Zero column-widths, allow the user to hide unwanted columns on the

spreadsheet (such as macros).
2. Recording of keystrokes as they are keyed into VP-Planner to develop macros, removing the requirement to key and debug macros as separate functions.
3. A directory of range names is available at all times.
4. Provision of relative GoTO's allowing interpretation of two cells' contents from which the address references are derived.
5. Up to 6 spreadsheet windows can be displayed at once.
6. Spreadsheets can be printed in background mode, allowing the user to continue working with spreadsheets in the foreground.

These are straight forward enhancements to Lotus' facilities; worthwhile but not particularly amazing.

However there are also a number of major extra functions that really turn VP-Planner into something special.

The first of these is something that is provided in Version 2 of Lotus 1-2-3, namely sparse-matrix storage.

This impressive-sounding technique allows much larger spreadsheets to be developed in the same amount of working memory than the equivalent Lotus Rel 1A spreadsheet.

In Lotus 1-2-3 Rel 1A the amount of memory required for a given spreadsheet is simply a function of the total size of the spreadsheet (viz columns x rows x size of cells) – regardless of whether the cells actually contain anything or not.

In a sparse-matrix spreadsheet, the memory used is only related to those cells containing information.

One drawback of this technique however is that calculation times for largish spreadsheets can suffer somewhat, as cells no longer relate directly to memory table addresses.

As a result VP-Planner, like Lotus 1-2-3 version 2, is somewhat slower than Lotus 1-2-3 Rel 1A when calculating large spreadsheets.

I do not feel that this would cause a significant decrease in performance, especially given the offset improvement in increased storage capabilities.

However, it is somewhat disappointing that like Lotus 1-2-3 Rel 1A the Intel 8087 math co-processor is not supported in this version of VP-Planner. When this accessory chip is present in the system this provides a worthwhile speeding up of mathematical functions and would have compensated greatly for the slower performance due to sparse-matrix storage techniques.

New concepts

In addition to all the standard Lotus functions, one of the greatest strengths of VP-Planner is the ability to easily create, browse and update dBase II and dBase III database files.

Basically this allows dBase files to be used as the storage medium for any cell's contents. And these files can be linked together on key fields to provide relational data access.

dBase files can even be used to create libraries of macros for use in spreadsheets.

The multi-dimensional database facility is in fact a separate database access method all of its own. It is particularly appropriate for consolidation of large quantities of data, where most spreadsheet programs (and users) would curl up.

For example, a common spreadsheet might be product sales by month, with products being listed in rows across the spreadsheet, and sales listed in monthly columns down the spreadsheet (for corresponding products). Typically another category of information would need to be added to this spreadsheet – sales-region, or sales-person, or year etc.

Previously this would have been achieved by creating a copy of this spreadsheet for each sales-region, sales-person, or year etc. To achieve a consolidation of figures, one would also have to link all these individual spreadsheets together and provide a consolidation spreadsheet at the end.

Adding yet another category would mean creating many, many more spreadsheets... most users would give up after the 2nd category.

In VP-Planner this same process is achieved by defining each of the categories, logic-statements relating to consolidation, and the pathway by which the data will be accessed by using the "create/edit multi-dimensional database structure" function on the main menu.

Five dimensions

Databases with up to 5 dimensions, each comprising up to 254 categories, can be achieved (although the product of the categories in dimensions 1 and 2 must not exceed 16,000 for some reason). The maximum file size is a substantial 17 megabytes.

This approach to handling spreadsheet data will probably be the most significant feature that VP-Planner introduces. It is something that I forsee all worthwhile spreadsheet packages to be emulating within 12 months or so, and it will be interesting to see Lotus's response.

No doubt Paperback Software will also be developing and improving VP-Planner. It is interesting to speculate whether the next angle of attack might be to provide a complete dBase II look-a-like package to complement the excellent interface provided here.

Rumour has it that a later VP-Planner release should be available by the time you read this, providing DIF file support, and some improvement in calculation times. This release will be available to registered users for a nominal (or zero) charge.

New standard

VP-Planner sets a new standard in terms of spreadsheet styled database packages for four very important reasons:

1. Comprehensive sparse-matrix spreadsheet facilities – at least as good as Lotus 1-2-3 version 1A – with the same command structure as Lotus.
2. The ability to use multi-dimensional spreadsheets for those situations where data is defined in more than 2 dimensions. This would be accomplished by means of linked spreadsheets in traditional spreadsheet packages.
3. Capability to create, update, and retrieve dBase files and use within spreadsheets.
4. A better than 4-to-1 price advantage over Lotus 1-2-3.

Up to now Lotus 1-2-3 may well have been the number one spreadsheet package for the rank and file IBM PC user, but it would do well to look to its laurels with a product of the calibre of VP-Planner being released at a drastically lower price and with a number of significant improvements over Lotus.

I suspect that right at this moment, in some cigarette smoke-filled office in Cambridge Massachusetts, a team of Lotus programmers may be working their little hearts out trying to come up with some answer to what is really a tour-de-force from Mr Osborne and his band of merry men.

At-A-Glance:

Product Name:	VP-Planner, by PaperBack Software
Type:	Lotus 1-2-3 spreadsheet look-a-like with multi-dimensional spreadsheet and database access capabilities
Requirements:	IBM PC/XT/AT and most compatibles DOS 2.0 or later 256K minimum memory, (640K maximum usable by program)
Cost:	$259

(Review software provided by Arcom Pacific, Hamilton)

AMPS, an efficient weaver

by Mark James

In the growing market for multi-user microcomputers, half a dozen operating systems are vying for prominence. One of them was designed and created in New Zealand, and it is this system, AMPS, to which we turn our attention this month.

Before we start, let me confess to a lack of total objectivity when it comes to AMPS. For the past two years, I have been involved with AMPS in a technical support role. This means three things: I am an AMPS enthusiast; I know the system inside out; and I am on the payroll of Advanced Management Systems in Auckland, the company which developed AMPS. I do not, however, speak for Advanced Management Systems. The following judgments are my own.

Like the other multi-user systems, AMPS consists of an operating system kernel underlying a cluster of software sub-systems; these include text processing, office automation, program development, system utilities and games. While all of these sub-systems are integrated, it is possible to purchase AMPS without the program development facility.

Efficiency

AMPS resembles competitors PICK and BOS in many ways. Like BOS, it implements a form of pseudo-code that is totally portable from one machine type to another; programs written for one AMPS system are guaranteed to run on any other, regardless of hardware. Like PICK, AMPS uses an extensive disk cache, so that data need not be read in from disk if they are already in memory.

What sets AMPS apart is its level of hardware efficiency.

Of course, every system likes to tout its efficiency; only AMPS, however, can claim to support 33 users on an IBM-PC/AT. (By way of comparison, BOS claims to run 19 users on that machine; PICK is said to have a version "on the way" that can support up to 17; and XENIX, a UNIX variant, can run eight.)

To be sure, even three or five users on one microcomputer is an impressive achievement, as long as response times average something less than a week.

It would be senseless, for example, to have 33 people running disk-heavy programs on a PC/AT; IBM's hard disk, which is of only medium performance, could never keep up, no matter how efficient the operating system might be. However, 33 people doing client look-ups, for example, or using the text editor, would be quite acceptable.

There are, of course, trade-offs involved in achieving this level of efficiency; but AMPS uses a number of design tricks to minimise the effects of these trade-offs. Some of these tricks are quite unique. To get an understanding of how AMPS works, it is worth looking at the database and the program development module.

The AMPS database

Like PICK, AMPS is structured entirely around a single, monolithic database. Everything about the system – programs and data, text, the spelling dictionary, even the database software itself – everything is stored as records on the database. Each record on the database has a unique key, and the system automatically maintains a hierarchical, balanced-tree index structure of these keys.

Multi-User series: Part V

Although the underlying database structure is hierarchical, sections of it may be designed to function in a relational or network manner. Except in the case of the query language (described below), this is not done automatically by the system; it requires the intervention of an analyst programmer.

Other than physical disk space, there are no limits to the size of the database, or to the number of records that it may contain or that may be available to any one program. You do not have to declare file sizes or worry about data reorganisations. The database can grow or shrink, have chunks deleted out of it and reuse the space for something else; related records may be scattered physically all over the disk, but the index structure will impose a logical order on things. All of this is done automatically, so that neither the programmer nor the end user need be concerned with it.

Database segments are cached according to a strict most-recently-used order. This guarantees that frequently-used data are kept constantly in memory. In addition, program modules have their own, separately-maintained cache.

Since program modules are also records on the database, they benefit from both caches at once. The result of this is that the system almost never has to read in commonly-used programs (such as the editor) from disk; they tend already to be in memory. Response times for these programs, then, are very quick.

This becomes very important with a large number of users on the system. Under AMPS, all programs and data are snareable (unless specified otherwise for security reasons). If you have 33 people using the editor, for example, you do not have 33 copies of the editor program cluttering up memory and slowing things down with constant disk accesses. There is only one copy, and it stays in memory all the time.

Most of the memory in an AMPS system is devoted either to the database cache or to the program cache. The system manager can, if desired, adjust the mix between the two, depending on the diversity of the programs likely to be run that day.

Program Development

Like most multi-user systems, AMPS supports only one programming language; unlike most, however, AMPS uses its own language.

It is called AMPLE, and it resembles a cross between PASCAL and a highly-structured COBOL. Although AMPALE contains a GOTO statement, this is almost totally ignored in the documentation; AMPLE aspires to be a completely structured language.

Program development in AMPLE takes advantage of the system's hardware efficiency. Compiles, for example, are very fast – typically between five and twenty seconds for, say, a message switching system.

A program generator can take care of simple database look-up and update programs, and is useful as a prototyping tool for more complex applications.

The compiler, editor and debug program are integrated; you switch from one to another with the press of a function key.

One of the trade-offs involved in achieving efficiency concerns the use of AMPLE. It violates one of the most sacred rules of operating system design: that the programmer should not have to bother with time-sharing. To understand this, we must look at how most multi-user systems share the system between tasks.

Time share

Most systems use a philosophy of time-sharing called multi-threading. This means that each task running on the

system is its own "thread", and need not be aware of the other threads running around it. Since the microprocessor can handle only one thread at a time, it chops each one into arbitrary segments – typically one-tenth of a second in length – and flips from one to the next.

The advantage of multi-threading is that it happens behind the scenes; neither the programmer nor the end user need be aware of it. The disadvantrage is that it is ineffecient, and can be horribly so.

If a task is in the middle of something when it gets cut off, the system must save its status and its snared buffers someplace, then replace them when that "thread" comes up for execution again. If there is not enough memory for all the threads, then the system must "swap" some of them out to disk, then swap them back in again.

A multi-user system could easily spend much more time in its time-sharing duties than in executing the threads themselves.

A single-threading system, by contrast, treats each task on the system as different segments of the same thread, and does no arbitrary chopping. It is the responsibility of each program to give up control of the central processor in timely fashion.

If this is done properly – for example, if each task gives up control exactly when it has nothing to save away – then the whole system can benefit from dramatically improved performance. If it is done poorly, you get people pounding their keyboards in frustration, while some selfish task forgets to yield control of the processor.

Automated

Single-threading was abandoned twenty years ago by most operating system designers, on the ground that it was impossible to train programmers to use it properly. This was particularly true with languages like COBOL, in which programmers had to specify data movements to and from buffers; keeping track of all that across a time-sharing break was too much to ask.

Two changes have occurred in the past twenty years which have once again raised the question of single-threading systems. One is the advent of so-called fourth generation languages, in which data movement has become an automatic function of the operating system, thus relieving programmers of that burden.

The other change has been the growth of on-line transaction processing. In this type of computer system, most of the activity involves recording certain transactions (for example, bank account deposits and withdrawals) on a computer – the kinds of things that used to be done on punched cards. Records are called up, perhaps modified, deleted, new ones added.

Transaction processing is ideally suited for a single-threading computer system, since there is a very logical place to insert time-sharing breaks in the programs: while you are waiting for an operator to key something in. The AMPLE language is designed entirely around this concept; and since 90% of the AMPS system is written in its own language, it is fair to say that AMPS as a whole is tuned toward a transaction-processing environment.

It is also fair to say that AMPS should not be considered for computer systems that are far removed from transaction processing. It would rate poorly at number crunching; since it implements an interpreted pseudo-code, calculations are not rapid in AMPS. A batch-processing system, where large amounts of information are collected off-line and then fed into the computer in one massive update run, usually at night, would also run slower under AMPS than other systems, since there would be little opportunity to take advantage of single-threading.

On the other hand, anything that can be operated as transaction processing will run well under AMPS. Text editing is a case in point. The AMPS editor treats text as records on the database; modifications to the text are simply transactions on those records. Similarly, spreadsheet recalculations are dealt with as transactions on the spreadsheet information.

Friendliness and security

AMPS presents two faces to the user. To the beginner, everything is listed on menus, with two-letter mnemonic codes calling up system functions or other menus, and there is plenty of on-line help available.

The experienced user, however, will wish to bypass the menus; AMPS makes extensive use of function keys for this purpose. In fact, many people design their own menus containing nothing but function keys and a few mnemonics.

Menus are also one of the security elements in AMPS. Users are given (or denied) access to sensitive programs according to a set of access classes whose meanings are defined by the system manager of each company at an AMPS site (up to 255 companies may share an AMPS system). Menus are structured dynamically to reflect a person's access privileges.

The system protects itself with a standard password procedure; it does nasty things to you after an unreasonable number of unsuccessful attempts to log on. There are other such "hacker traps" as well, intended to defend the system against intrusion or tampering.

There is the usual array of full and partial backup and restore programs, copying data to either diskette or tape (AMPS supports nine-track tape on all types of computers, even PCs). AMPS is, to my knowledge, the only microcomputer system that offers a full transaction logging facility, so that all is not necessarily lost since the last backup if the disk should burn up.

The AMPLE language offers a full set of file and record locking instructions, but surprisingly, these are seldom used. This is a side benefit of single-threading, since a program knows exactly how long it has exclusive control of the computer; it need not lock those records that it can finish with inside one time slice.

Summary

AMPS was not at first intended to be sold as an independent operating system; it was created simply as the in-house software development environment at Advanced Management Systems, who were writing insurance packages (hence, of course, the emphasis on transaction processing).

Since its launch as a separate product early last year, its user base has grown to over 300 in New Zealand and Australia. This is not much by the standards of PICK or UNIX; but the company hopes to take AMPS to the American market later this year, where the potential may be very large.

If its news. . . ring Steven Searle, 796-775

More Power, More Punch

Available in a wide range of models, both portable and desktop, the AWA CORONA Personal Computer is designed to give you MORE of everything.

HARDWARE Based on a 16-bit 8088 microprocessor, the IBM-compatible CORONA PC comes with 128K bytes for twice as much memory and a fast access 320K byte floppy disk drive.

POWER The CORONA PC is equipped with an extra large power supply for an extensive hardware growth path capability.

SPEED The addition of a 10M byte CORONA Personal Hard Disk affords you a highly reliable, greatly expanded storage system at 10 times the speed.

EASE The CORONA PC has several features, ergonomically designed to ensure greater ease of operation with an appreciably reduced fatigue factor for the user.

SOFTWARE MS-DOS is not the CORONA PC's only standard feature. Standard as well are GW (Graphics Writer) -Basic, the MultiMate Word Processor and the self-teaching PC Tutor training course. Most IBM-compatible software tools will run on your CORONA PC.

"REVELATION" PC SOFTWARE A Pick-compatible operating system with access to a wide range of application software. "Revelation", combined with your CORONA PC, will more effectively place computer power in the hands of all operators, including those with minimal levels of DP experience.

In a word: AWA's CORONA Personal Computers offer just one thing—MORE.

For further information contact
AWA Data Systems Division:

AUCKLAND
P.O. Box 1363, Grey Lynn
Phone: 760-129

WELLINGTON
P.O. Box 50248, Porirua
Phone: 851-279

CHRISTCHURCH
P.O. Box 32054
Phone: 890-449

CORONA PERSONAL COMPUTERS
THE PORTABLE PERSONAL COMPUTERS

corona data systems, inc.

Guaranteed by:

AWA *New Zealand Limited*

AWD 2610

LATEST SOFTWARE AVAILABLE IN N.Z. OR DIRECT OVERSEAS MAIL ORDER

COMMODORE C64

CMICROPR95	Acrojet	D	55.95
CMASTERT75	Action Biker	T	14.95
CPROBE25	Adv. Of Basidon Bond	T	45.95
CELIT65	Airwolf	T	35.45
CAMERICA35	Asylum	T	40.65
CAMERICA55	Asylum	D	49.50
CMASTERT25	BMX Racers	T	14.95
CELECTRI65	Back To The Future	T	48.20
CMIRRORS95	Biggles	T	45.75
CMIRROR85	Biggles	D	59.55
CELITE115	BombJack	T	36.60
CELITE120	BombJack	D	68.75
CACTIVI195	Borrowed Time	D	68.75
CDATABIT15	Boulder Dash II	T	42.95
CGREMLINF5	Bounder	T	39.95
CGREMLIN75	Bounder	D	54.00
CIMAGINE85	Comic Bakery	T	43.95
CELITE55	Commando	T	39.95
CELITE95	Commando	D	54.95
CBEAUJOL55	Computer Hits	T	39.95
CBEAUJOL65	Computer Hits	D	39.95
CDURRELL45	Critical Mass	T	43.95
CUSGOLD85	Crusade in Europe	D	60.00
CMICROP105	Decision In The Desert	D	60.00
CSYDNEY15	Desert Fox	D	62.60
CSYDNEY45	Desert Fox	T	49.30
CELEC/OR15	Deux Ex Machina	T	43.95
CMICROP035	Doc. Who/Mines/Terror	T	43.95
CACTIV75	Eidolon	T	45.95
CACTIVI115	Eidolon	D	60.10
CENGLISH25	Elektra Glide	T	41.20
CENGLISH35	Elektra Glide	D	53.95
CFIREBIRD5	Empire	T	45.75
COZISOFT15	Europe Ablaze	D	62.25
CMIKROGE35	Everyone's A Wally	T	49.95
CADDICT145	Football Manager	T	43.95
CMASTERT35	Formula I Simulator	T	14.95
CHUTCHIN15	Fourth Protocol	T	59.60
CACTIVI105	Game Maker	D	68.95
CPUBLICD15	Gazette Feb 1986	D	24.95
CPUBLICD25	Gazette March 86	D	24.95
CPUBLICD35	Gazette April 86	D	24.95
CFIREBI25	Gerry The Germ	T	36.60
CARIOLAS	Golf Construction Set	D	54.00
CUSGOLD81	Goonies	T	39.95
CDATASOF25	Goonies	D	48.95
CIMAGINE95	Green Beret	T	41.20
CINFOCOM25	H/Hickers Guide/Galaxy	D	89.95
CACCOLAD15	Hard Ball	T	43.10
CACOLADE15	Hard Ball	D	45.00
COZISOFT25	Infiltrator	D	49.50
CSUBLOGI15	Jet	D	109.95
CMASTER855	Kane	T	14.95
CMASTER15	Kentilla	T	14.05
CSIERRA55	Kermits Elec Storymaker	T	46.70
CSIERRA65	Kermits Elec Storymaker	D	59.30
CMASTERT65	Kick Start	T	14.95
COCEAN185	Knight Rider	T	41.20
CDATAEAS15	Kung Fu Master	T	45.75
CDATAEAS25	Kung Fu Master	D	62.20
CEL/ARTS15	Last Gladiator	D	45.00
CMASTERT55	Last V8	T	14.95
CUSGOLD95	Law Of The West	T	43.95
CMEL/HO95	Lord Of The Rings (+ Bk	T	52.50
CMEL/HOU75	Lord Of The Rings (+ Bk	D	60.00
CNEWGENE11	Machine Code Tutor	T	68.80
CMASTERT45	Master Of Magic	T	14.95
CENGLISH85	Mediator	T	43.95
CENGLISH95	Mediator	D	51.95
CNOVAGEN45	Mercenary	T	39.95
CNOVAGEN55	Mercenary	D	50.00
CACTIV95	Mindshadow	T	45.95
CBUGBYTE25	Mr Mephisto	T	18.95
CDATABYT25	Mr Robot/Robot Factory	T	43.25
CDATABYT15	Mr Robot/Robot Factory	D	54.75
CMEL/HOU25	Mugsy's Revenge	T	39.95
CFIREBI15	Nightshade	T	45.75
CACCOLAD25	PSI 5 Trading Co.	T	39.75
CCOMMODO45	Pazazz	D	60.10
CMASTER115	Phantom of the Asteroid	T	18.95
CBRODERB45	Printshop Lib. 1	D	69.00
CARIOLA55	Racing Destruction Set	T	42.50
COCEAN135	Rambo	T	36.60
CFIREBI145	Rasputin	T	31.95
CADV/SOF45	Rebel Planet	T	36.60
CMEL/HOU95	Red Hawk	T	37.85
CFIREBIR65	Revs	T	52.00
CFIREBIR75	Revs	D	58.00
CMELBOUR35	Rock 'N Wrestle	C	45.80
CMELBOUR45	Rock 'N Wrestle	D	68.80
CMASTERT85	Rockman	T	14.95
CMICROPR85	Silent Service	D	60.00
CMICROP15	Silent Service	T	51.95
CBUGBYT15	Sky Hawk	T	33.00
CUSGOLD255	Spy Hunter	T	34.95
CMIRROR25	Star Seeker	D	55.30
CC.D.S.45	Steve Davis Snooker	D	53.95
CTASMAN15	Tasword 64 (80 Col.)	D	85.00
CTASMAN25	Tasword 64 (80 Col.)	T	75.80
CEPY15	Temple/Apshai/Trilogy	D	45.00
CULTIMAT75	They Sold A Million II	D	68.75
CULTIMAT95	They Sold A Million II	T	45.75
CHITSQUA15	They Sold A Million II	T	39.95
CFIREBI105	Thrust	T	14.95
CTRAS AT15	Tigers In The Snow	D	54.50
COCEAN125	Transformers	T	38.00
CHEWSON65	Uridium	T	43.95
CHEWSON75	Uridium	D	51.75
COCEAN155	V	T	39.95
CIMAGINE75	W.S. Baseball	T	33.60
CGREMLIN85	Way Of The Tiger	T	43.50
CALLIGAT65	Who Dares Wins 2	D	45.00
CALLIGAT75	Who Dares Wins 2	T	39.75
CARIOLA115	Wild West	T	47.95
CARIOLA125	Wild West	D	59.60
CINFOCOM15	Wishbringer	T	147.00
CIMAGINE25	Yie Ar Kung Fu	T	42.50
CIMAGINE45	Yie Ar Kung Fu	D	42.25
CRHINO25	ZZz	T	18.95
CMARTECH35	Zoids	T	42.95

SPECTRUM

REFERENCE	TITLE	T/D	NZ$
SMASTERT55	Action Biker	T	14.95
SELITE25	Airwolf	T	33.95
STHOR15	Arc od Yesoo	T	41.20
SRAINBIR15	Art Studio	T	49.50
STHORNEM55	Artist	T	59.60
SC.P.S.14	Astronomer 2	T	43.50
SHEWSON55	Astroclone	T	36.60
SMASTERT35	BMX Racers	T	14.95
SMICROSP75	Back To Skool	T	36.20
SELECTRI15	Back To The Future	T	43.95
SOCEAN135	Batman	T	36.60
SMIKROGE75	Battle Of The Planets	T	45.80
SACCESS45	Beachead II	T	42.95
SDKTRONI55	Benny Hill's Mad/Chase	T	39.75
SMIRROR115	Biggles	T	45.75
SOXFORD25	Blast (Basic Compiler)	T	114.80
SELITE45	Bomb Jack	T	36.60
SBUBBLEB25	Brainstorm	T	18.95
SC.P.S 24	Bridge Player 3	T	39.95
SUSGOLD115	Buck Rogers	T	39.95
SLUCASF15	Ball Blazer	T	38.95
SPALACE15	Cauldron	T	36.95
SELITE75	Commando	T	36.00
SBUDGIE15	Convoy	T	11.50
SFIREBI15	Costa Capers	T	36.60
SDURRELL65	Critical Mass	T	38.00
SSYDNEY11	Dambusters	T	39.95
SCASECOM15	Desert Rats	T	46.95
SMASTERT15	Devils Crown	T	14.95
SARTIC25	Discs Of Death	T	32.00
SHEWSON21	Dragon Torc	T	36.60
SORPHEUS25	Eidon	T	40.30
SFIREBIR55	Elite	T	54.95
SFIREIRD5	Empire	T	45.75
SCRL55	Endurance Racing	T	36.60
SBEYOND14	Enigma Force	T	49.35
SMIKRO-G45	Everyone's A Wally	T	45.80
SP.S.S.45	Falklands 82	T	36.60
SRABBIT15	Fire Of London	T	36.00
SMASTERT25	Formula 1 Simulator	T	14.95
SFIREBI45	Gerry The Germ	T	36.60
SDOMARK35	Gladiator	T	38.00
SC.P.S 55	Golfing World	T	29.95
SELITE55	Grand National	T	35.95
SIMAGINE45	Green Beret	T	42.00
SULTIMAT65	Gun Fright	T	47.95
SADV/INT15	Gremlins	T	47.95
SCELECTR15	I Of The Mask	T	45.80
SGILSOFT35	Illustrator	T	62.95
SSYSTEM315	International Karate	T	29.90
SARTIC15	International Rugby	T	38.70
SOCEAN175	Knight Rider	T	36.60
SALLIGAT15	Knockout	T	24.95
SBUDGET15	Labyrinthion	T	14.95
SOCEAN165	Laser Compiler	T	45.95
SMEL/HOU65	Lord Of The Rings	T	57.50
SCAMPBEL14	Masterfile (With Print)	T	49.95
SQU/SILV35	Max Headroom	T	43.30
SIMAGINE75	Movie	T	39.75
SMEL/HOU95	Mugsy's Revenge	T	42.95
SOCEA55	N.O.M.A.D.	T	36.60
SGEMINI75	Office Master	T	69.00
SARIOLAS25	Panzadrome	T	36.00
SIMAGINE85	Ping Pong	T	40.95
SDKTRONI45	Popeye	T	34.00
SHEWSON85	Quazitron	T	37.85
SOCEA85	Rambo	T	38.70
SADV/SOF45	Rebel Planet	T	45.75
SDATABAS25	Red Arrows	T	42.95
SALPHABA15	Robot Messiah	T	36.60
SBUGBYTE	Robotg	T	18.95
SMASTERT45	Rockman	T	14.95
SDURRELL85	Saboteur	T	38.00
SMIRROR105	Sai Combat	T	36.60
SMARTECH55	Samantha Fox/Str/Poker	T	42.95
SALLIGAT25	Show Jumping	T	39.00
SMIKROGE15	Sir Fred	T	39.95
SEL/ART45	Sky Fox	T	45.60
SSTBRIDE15	Snow Queen	T	41.20
SBEYOND75	Sorderons Shadow	T	34.95
STASKET45	Souls Of Darkon	T	36.60
SMIRRORS65	Spitfire 40	T	43.95
SSEGA55	Spy Hunter	T	34.95
SOCEAN125	Super Bowl	T	45.95
SBEYOND24	Superman	T	39.95
SGARGOYL45	Sweevo's World	T	38.95
SPSS25	Swords And Sorcery	T	49.35
STASMAN25	Tascopy	T	45.55
STASMAN35	Taswide	T	25.30
STASMAN15	Tasword Three	T	75.95
SC.R.L.45	Tau Ceti	T	42.50
SARGUS15	The Bulge	T	45.95
SMARTECH85	The Planets/Final Front	T	45.75
SULTIMAT95	They Sold A Million II	T	45.75
SARIOLAS85	Think	T	39.75
SMIKROGE65	Three Weeks In Paradise	T	47.95
SDIGITAL55	Tomahawk	T	39.95
SOCEAN115	Transformers	T	36.00
SDURRELL75	Turbo Esprit	T	42.95
SOCEAN15	V	T	42.00
SINSIGHT25	Vectron 3D	T	38.95
SDOMARK15	View To A Kill	T	44.95
SIMAGIN115	W.S. Baseball	T	33.60
SINTERC15	Warlord	T	32.00
SLOTHLOR25	Waterloo	T	45.80
SMEL/HOU25	Way Of Exploding Fist	T	38.00
SGREMLI105	Way Of The Tiger	T	43.50
SGREMLI35	West Bank	T	39.75
SALLIGAT35	Who Dares Wins 2	T	40.30
SEPYX85	Winter Games	T	38.70
SELECTRI65	Winter Sports	T	41.20
SEL/ART35	Wizard	T	36.00
SIMAGINE25	World Series Baseball	T	33.60
SLEVEL995	Worm In Paradise	T	39.95
SACTIV75	Xcel	T	36.00
SQU/SILV25	Yabba Dabba Doo	T	38.90
SIMAGINE21	Yie Ar Kung Fu	T	36.60
SMARTECH45	Zoids	T	39.75
SDATASO125	Zorro	T	38.95

AMSTRAD

REFERENCE	TITLE	T/D	NZ$
RMICROGE65	3 Weeks In Paradise	T	45.75
RAMSOF45	3D Grand Prix	T	39.95
RAMSOF55	3D Grand Prix	D	59.95
RELITE85	Airwolf	D	59.95
RC.C.S25	Arnhem	T	47.95
RACTIVI24	B. McGuigans Boxing	T	39.95
RACTIVI35	B. McGuigans Boxing	D	48.75
ROCEAN165	Batman	T	41.20
RSOLAR15	Battle Beyond The Stars	T	40.50
ROKTRONI55	Benny Hill's Mad/Chase	T	34.00
RELITE115	BombJack	T	45.75
RELITE120	BombJack	D	68.75
RSILVERS45	Lord Of The Rings	T	36.00
ROZISOFT15	Boulder Dash	D	49.50
RBIGFIVE15	Bounty Bob Strikes Back	T	39.95
RTHEEDGE	Brian Bloodaxe	D	52.00
RMASTERT45	Caves Of Doom	T	14.95
RDOMARK45	Codename Matt II	T	38.00
RC.D.S25	Colossus Chess 4	T	47.95
RBEAUJOL35	Computer Hits	T	39.95
RBEAUJOL45	Computer Hits	D	52.00
ROCEAN155	D.T. Super Test	T	41.95
RPROBE45	Devils Crown	T	39.95
RAMSTRAD15	Electronic Studio	D	73.95
FRIREBIRD5	Empire	T	45.75
RMEL/HOU55	Ex/Fist and F/Warrior	D	82.50
REDGE15	Fairlight	T	51.75
REDIGITAL45	Fighter Pilot	D	52.00
RMASTERT25	Finders Keepers	T	14.95
RMIRROR25	First Steps With Mr Men	D	49.95
RMASTERT15	Formula I Simulator	T	14.95
RELITE75	Frank Bruno's Boxing	D	52.00
ROCEAN125	Frankie Goes/Hollywood	T	42.95
RP.S.S25	Get Dexter'	T	43.30
RINCENTI35	Graphic Adv. Writer	D	87.40
RIMAGINE75	Green Beret	T	41.20
RVORTEX25	Highway Encounter	D	52.00
RVORTEX55	Highway Encounter	T	38.00
RIMAGINE85	Hypersports	T	39.95
RIMAGINE15	Hypersports	D	59.80
RELECTRI65	I. Of The Mask	T	39.95
RC.R.L.55	Juggernaut	T	36.60
RC.R.L25	Juggernaut	D	51.95
ROCEAN195	Knight Rider	T	41.20
RMEL/HOU75	Lord Of The Rings (+ Bk	T	66.50
RDATABAS45	Mini Office	T	29.95
RDATABAS65	Mini Office II	D	72.40
ROCEAN85	Movie	T	41.20
ROCEAN65	N.O.M.A.D.	T	41.20
RGEMINI55	Office Master	D	82.95
RGEMINI65	Office Master	T	66.95
RGEMINI115	Office Mate	T	62.95
RCENTRES15	Office Mate	D	64.95
RARIOLA65	Panzadrome	T	42.95
RIMAGIN155	Ping Pong	T	41.20
RDIS/SOF15	Pyradev	D	82.50
RACCESS55	Raid'	D	54.00
ROCEAN145	Rambo	T	43.95
RADV/SOF45	Rebel Planet	T	68.75
RLEISURE45	Scrabble	T	39.95
RLEISURE55	Scrabble	D	52.00
RARIOLAS55	Skyfox	T	48.60
RMASTERT35	Soul Of A Robot	T	14.95
RMIRROR45	Spitfire 40	D	49.95
RVIRGIN35	Strangeloop	T	41.20
RMIRROR35	Strike Force Harrier	D	54.95
RMIRROR15	Strike Force Harrier	T	43.30
RAMSOFT35	Stunt Rider	T	43.20
ROCEAN175	Superbowl	T	41.20
RBEYOND65	Superman	T	39.95
RGARGOYL35	Sweevo's World	T	45.80
RGARGOYL55	Sweevo's World	D	53.25
RAMSOFT15	Tank Commander	D	48.00
RTASMAN15	Tasword 464	T	54.95
RTASMAN35	Tasword 6128	D	99.95
RC.R.L 85	Tau Ceti	D	54.00
RC.R.L	Tau Ceti	T	45.75
RPSS25	Theatre Europe	T	45.75
RP.S.S45	Theatre Europe	D	49.95
RULTIMAT45	They Sold A Million II	T	45.75
RULTIMAT55	They Sold A Million II	D	68.75
RMEL/HOU65	Way Of Exploding Fist	T	39.95
RGREMLIN25	Way Of The Tiger	D	54.95
RALLIGAT35	Who Dares Wins II	D	49.95
RELECTRI45	Winter Sports	T	41.20
RELECTRI55	Winter Sports	D	54.75
RIMAGINE65	Yie Ar Kung Fu	T	38.00
RIMAGINE55	Yie Ar Kung Fu	D	60.00

C 6/PLUS 4

REFERENCE	TITLE	T/D	NZ$
PAUDIDGE15	3D Glooper	T	31.95
PCOMMODO15	Ace	T	24.95
PAMERICA75	Asylum	T	40.50
PMASTERT25	BMX Racers	T	24.95
PACCESS15	Beachhead	T	41.20
PELITE55	Commando	T	37.65
PBUDGIE15	Cyberg	T	18.95
PDCEAN15	D.T. Star Events	T	24.95
PSUPERS55	Flight Simulator 0-15	T	33.00
PSOLARS015	Galaxions	T	24.95
PCOMMOD465	Games Designer	T	46.00
PANIROG85	Ghost Town	T	35.80
PKINGSOF15	Grand Master	T	29.95
PWARNERB15	Gremlins	T	24.95
PGREMLIN15	Gullwing Falcon	T	24.95
PTYNESOF45	Gunslinger	T	39.95
PCOMMOD035	Harbour Attack	T	24.95
PNAVAJO15	Home Office	T	29.95
PGREMLIN45	Jetbrix	T	38.25
PAUDIOGE15	Kactus	T	31.95
PGREMLIN35	Kung-Fu Kid	T	35.45
PMASTERT35	Mr Puniverse	T	14.95
PTYNESOF55	Mount Vesuvious	T	31.95
PTYNESOF35	Olympiad	T	24.95
PATLANTI15	Panik	T	27.40
PTYNESOF65	Pogo Pete	T	31.95
PCHANNEL15	Pulsar 7	T	24.95
PRAZORSO25	Raider	T	30.00
PGREMLIN95	Reach For The Sky	T	36.95
PCOMMODO55	Script/Plus	C	89.95
PRAZORSO15	Sea Strike	T	30.00
PBUGBYT15	Sky Hawk	T	33.00
PATLANTI25	Space Escort	T	18.95
PADVENTU15	Spiderman	T	24.95
PC.D.S.15	Steve Davis	T	24.95
PGREMLIN25	Sword Of Destiny	T	24.95
PANCO15	Thai Boxing	T	39.95
PMEL/HOU25	The Wizard &/Princess	T	24.95
PANIROG95	TomThumb	T	27.40
PCITISOF25	Torpedo Run	T	42.00
PIMAGINE15	W.S. Baseball	T	39.75
PTYNESOF25	Winter Olympics	T	39.75

ATARI

AAMERICA65	Asylum	D	50.45
AAMERICA75	Asylum	T	40.50
AARIOLAS75	Axis Assassin	D	45.80
ADATASOF75	Bruce Lee	T	37.95
AFIREBIR15	Chimera	T	18.20
AENGLIS135	Colossus Chess	T	43.95
ALLAMASO15	Colourspace	T	34.50
ADATASOF35	Conan the Barbarian	T	49.75
ADATASOF55	Conan the Barbarian	D	52.00
AN.D.S.L.	Dam Busters	T	33.75
AACTIVI165	Eidolon	D	60.10
AENGLISH55	Elektra Glide	D	50.00
AENGLISH45	Elektra Glide	T	38.00
AADICT175	Football Manager	T	43.95
ASPINNAK97	Grandma's House	D	54.95
AINFOCOM65	H/Hickers Guide/Galaxy	D	89.95
ASPINNA127	In Search/Amazing Thing	T	54.95
AMICROP085	Kennedy Approach	T	52.00
AMICROP095	Kennedy Approach	D	58.00
AAMERICA15	Lucifer's Realm	T	68.80
AORIGIN25	Lucifer's Realm	D	68.80
AENGLISH95	Mediator	T	43.95
AENGLISH85	Mediator	D	51.95
ANOVAGEN35	Mercenary	T	39.95
ANOVAGEN45	Mercenary	D	50.00
AAMERICA25	Mission Asteroid	T	68.80
ADATABYT75	Mr Robot/Robot Factory	D	54.75
ADATABYT65	Mr Robot/Robot Factory	D	43.25
AOCEAN5	Neverending Story	T	45.80
AARGUSPR45	Schizofrenia	T	36.60
ASPINNAK15	Snooper Troops 1	D	54.95
AC.D.S.15	Steve Davis Snooker	T	45.80
AC.D.S.75	Steve Davis Snooker	D	53.95
ATASKSET15	The Big Dig	T	36.60
AP.S.S.15	Theatre Europe	T	45.80
AFIREBIR25	Thunderbirds	T	18.20
ATRANSAT85	Tigers In The Snow	D	54.50
AORIGIN35	Ultima III	D	91.80
ADOMARK15	View To A Kill	T	54.95
AINFOCOM15	Wishbringer	T	147.00
ALEVEL985	Worm In Paradise	T	39.95
AGREMLIN45	Zone X	T	45.80

THE NZ COMPUTER GAMES CLUB
PO BOX 18 NELSON PHONE 89-100

REFERENCE	TITLE	TAPE/DISK	PRICE
			$
			$
			$
			$

ENQUIRY ONLY — COMPUTER?

NAME (PRINT CLEARLY)

TOTAL $

PAYMENT ENCLOSED OR
CHARGE CREDIT CARD

/ /

EXPIRY DATE

PIONEERS OF SOFTWARE HIRE AND DIRECT ORDERING

ENQUIRIES WELCOME FOR CLUB DETAILS — FULL LISTS OF SOFTWARE TO HIRE AND BUY

Home micro market: Going, gone?

by Pip Forer

Recently Pip Forer was invited to attend an international symposium on educational computing in social sciences in London. While there he took the chance to review changes in the UK micro-computing scene over the last six years. In this first article he looks at the situation in the British home computer market.

The hardest thing to get in London right now is a ticket for the Andrew Lloyd-Weber musical "Chess"; the easiest is probably a knocked-down Sinclair QL.

In five years the British home micro industry has peaked and fallen back to slump, and some would say is headed for further contraction.

The evidence on the ground speaks of dramatic rationalisations and growing challenges and is mirrored on High Street by retrenchment and changing options.

There are fewer (and often thinner) microcomputing magazines in the book-shops.

While the business computing retail centres have grown larger and glossier the home machines have dropped back from public display.

The small shop dedicated to home microcomputers has often given way to a few feet of shelves for software displays in a bookshop or a space in an electronics shop window amongst the video or home security gear.

Prices are low, but margins are lower and knowledgeable service and support is almost totally absent (plus ce change..?).

The war between different home machine brands is a hot war and it is clear that four groups are involved.

Slashed prices

The first contains the old cheapos.

The 8-bit Ataris, the Commodore 64, the Sinclair Spectrum and the Acorn Electron can be seen at slashed down prices.

The one oddity in this has been Acorn's (discontinued) BBC model B microcomputer, of which new specimens are still avidly hunted and for which the second-hand market has boomed since its supercession.

All of these machines have been replaced by enhanced models.

Upgrades

These upgrades are the second group.

They are 8-bit based but all use bank-switching to provide additional memory and often include additional processors and hard-wired software. They have begun to hit the shelves in some volume in the UK.

Apart from the Apple IIc/IIe (which has been around some time but never really seen as a home machine in the UK), there are now the Commodore 128, the newer Amstrads, the BBC Master 128, a 128k Atari and, most recently, a 128k Spectrum that has had anything but glowing reviews.

Prices are drifting downwards, but not too quickly.

MSX presence

Next there are the MSX machines. MSX as a hardware standard is really targetted at the games market, so competes most directly with the cheaper 128s, especially the Spectrum.

These largely Japanese MSX machines are around and selling, but perhaps because they are designed to be interchangeable the individual brands make little impact on the micro scene. Even in combination MSX seems to have made limited impact.

New generation

Finally, in the wings, there are the new generation machines: the Macintosh, the Amiga and the Atari ST520 and 1040.

The UK scene – Part I

All of these are 68000 based (you would be hard put to find any home machine in UK that has chosen the Intel chip set for its base).

All have been designed on the notion that what home computing needs are machines so attractive that they can persuade the existing users to change their models and can also attract new users (a trick which the original 8-bit machines have increasingly lost).

The 128k 8-bit machines in particular are looking over their shoulders at these new machines.

However while all three models above are attracting attention from the keen home computerist one of them is currently priced out of most homes (the Macintosh) and one (the Amiga as of May 1st) was as ethereal in its actual presence in the UK as it has been in New Zealand.

This leaves the Atari ST series. With the 1 megabyte 1040 system, disk drive and all, selling for under $2,500 this was proving a magnet to many users and even beginning to attract a software base.

In spite of criticisms of its overall architecture and being overshadowed by Amiga hype the Atari has not lain down and died. It may indeed be making it successfully through its first few critical months of life.

Buy British?

From a British perspective the concern is that none of the new technology above is domestic (although some components of the systems have British origins).

The one British home machine that broke from the 8-bit mould was the Sinclair QL. This is not widely represented in any current British developments and is now in possibly terminal eclipse, depending on the whims of its new owner.

Dogged by premature release, excessively optimistic publicity and inadequate peripherals most observers see the QL as too recent to have adequate software and too flawed now to attract it.

And what of the British manufacturers behind the machines?

Most potent has been the rise of Amstrad which enjoys by far and away the lion's share of exposure through retail outlets.

By marketing a full system at a low cost Amstrad have turned a brand of reliable but unexciting micros into irresistible buys of the moment which dominate new purchases.

Although initially short of software many authors have converted games across to the Amstrad home computer.

The real excitement has been Amstrad's scheme to produce an IBM clone (with access to all IBM-PC's software) for under four hundred pounds.

Amstrad typifies the lesson that marketing counts.

Amstrad are the winners. The losers and runners-up so far have tended to be more innovative but less well managed.

Numerous small makers have gone forever (glittering names like the Dragon, Oric and Jupiter condemned to the dusty pages of back numbers of Personal Computer World).

The most publicised problems however have been those of the survivors, principally Acorn and Sinclair.

Acorn have recovered from their delusions of grandeur when they tried to 'break out of the educational ghetto' (one of their executive's misplaced words, not mine) by trying to bite off the home market, the US market and the business market simultaneously.

Acorn soldier on under Italian ownership, concentrating now on their real strengths and still selling an apparently expensive machine through its unusual capabilities.

In the long run the sale of Acorn to European interests may come to be seen as a significant loss to British industry.

More so in fact than the collapse of Sinclair.

The sale of Sinclair's home computer operations to Amstrad in April caused much bitterness amongst his (now former) workforce since alternative offers were on the table that would have saved their jobs.

The take-over leaves the QL in limbo and the Spectrum to be repackaged.

The optimists see the merger as combining Amstrad's market strengths with much-needed innovatory expertise. Financiers seem more cautious.

Declining prices will eventually bring the new-wave machines down into direct competition with the likes of the Spectrum 128, until the savings on the smaller machine will not be worth the difference in performance.

At present there are no signs of any significantly new home machine under development to meet this challenge, and it seems doubtful that any British manufacturer (even Amstrad) can live on imitating others indefinitely.

All is not gloom however. There are some interesting software initiatives, some exciting development combining computers and video, and the start of progress towards a European educational (and possibly home) micro. More on these in future issues. ■

Wozniak sees hope for Apple

by John MacGibbon,
in Wellington

REFLECTIONS FROM STEVE WOZNIAK AND ANDY HERTZFELD ON APPLE INC, AND OTHER OCCUPATIONS DURING A FLYING VISIT DOWNUNDER FOR BREAKFAST

Steve Wozniak, who less than a year ago made his much publicised exit frm Apple Inc, now believes the company he co-founded is back in good shape.

"Things ae in good hands now — technically and businesswise," Wozniak told members of New Zealand's Wellington Apple Users' Group in December.

Wozniak was speaking and answering questions during his second annual breakfast meeting with the 250-member user group.

Wozniak first visited Wellington on a crazy whim in 1984, after club members invited him to a champagne breakfast at Pizza Hut. During that first visit Steve was extremely critical of the direction Apple was headed, and he particularly objected to the cavalier way he believed the Apple II division was being treated.

At the 1985 breakfast Woz' attitude had swung practically full-circle. The Apple II now enjoys much support throughout the company, Woz told his audience.

"Good enhancements — things that should have been done five years ago, are all happening, he said.

"Look at the recent peripherals that have come out: the megabyte memory card, 3.5 inch 800K disk drives, the printer is in excellent shape. Everything's starting to come together.

"The next real enhancements are more along the lines of increased memory, increased memory capability with a slightly different processor, a lot of co-processor thinking, the Apple II working into an environment where another computer and software exists including IBM. Also more Amiga-like colour.

In balance

"John Sculley has put together the right management and key teams — ones who work well together and work in the interests of the company. He's done a very good job of planning our three major product lines — IIe, IIc and Macintosh — and making them all play in balance. They're all doing well, all being enhanced and all being supported well.

We'd been in a mode for quite a few years at the company where one product would be a personal favourite and would get all the attention and support while other products would be neglected. That's not the case currently."

Wozniak praised the technical direction being pursued by ex Apple France's Jean Louis Gasson. He particularly liked a new policy of giving major development work to outside contractors, including some people who had previously been key engineers within Apple itself.

On his latest visit, Steve brought his friend and fellow Silicon Valley legend, Andy Hertzfeld. Hertzfeld worked on the Apple II, and then transferred to the Macintosh project, where he wrote a good deal of the operating software. Now working independently of Apple, Mr Hertzfeld is perhaps best known for his Switcher software for the Mac, and the Thunderscan digitiser.

On Steve Jobs

Wozniak was generally more subdued in 1985 than in the previous year, but he did open up at great length on the subject of his former partner Steve Jobs:

"Steve Jobs — let's see — there was an episode occurred, and ah ... a relatively interesting set of stories led up to it. (Laughter)

"Let me give you a little bit of a story ... (more laughter).

"I had fallen in love with an idea for a really great product — a hand-held programmable remote control nifty little thing (to control household appliances like videos).

"I could obviously have got its development funded at Apple to any extent I wanted, just because of who I was.

"But if I ever developed it at Apple it would never become an Apple product. Every manager at Apple said it wouldn't because it wasn't a computer and it didn't plug into a computer. If I did it at Apple, they would not put it out as their product, but meanwhile they would own it. And that the world could be deprived of it, was the risk.

"So I left and started my own company (Cloud Nine). But I was very up front. I went on the bulletin boards, drew pictures, showed everyone at Apple, right up to Scully. I told Steve Jobs. I made sure everyone knew what I was doing, because you can't make it look like you were holding something back later. That will always haunt you."

Early in his new company's history Wozniak contracted a plastics design and moulding company to produce a case for his product. Trouble occurred on Sunday when Steve Jobs visited the company and saw drawings for the case.

When told what it was, Jobs "told them to package them up and send them to me and he'd pay for them."

"It's hard to understand why he did it. He stated publicly that it was because it was a product related to Apple's products. That I should not use a firm that Apple was using. Privately, he said a lot of different things. It was a personally motivated gesture.

"We had it, of course in writing from Apple in the friendliest terms that it didn't relate to Apple's products. But publicly he took a stand that it was competitive."

On Jobs' departure

"Well now he's kinda on the outs with Apple. Jobs brought Scully on board a couple of years ago. And boy, Steve was his spiritual leader — Scully's inspiration as to the direction computers were going: what did they mean to the people, they would change our lives and in what way. For about a year, everywhere Jobs went, John Scully was two feet away — six inches away!

"After about a year I started noticing at conferences that Jobs and Scully would be on opposite sides of the room. There wasn't the same close-talking friendship. That link was no longer there.

"Recently it was just as if he'd taken a little too much of Jobs' view, and now saw it might not be totally in the interests of the company owners. At the end of it, Steve was out of any direct responsibility at Apple.

"Oddly enough, when I go 'round to Scully now we sit down, and he's OK.

"In the meantime Steve has decided to go off and start this company. I can't really talk too much of what I know regarding discussions at different levels with different people, because it's in litigation. But Apple is claiming that he's doing somthing using Apple technologies or whatever the term is.

But the two former partners have not severed all connections:

"Steve Jobs called me up one night and thanked me, because I said on a TV interview that whatever he builds will be so great it'll improve my life and I'll go

and buy one.

"But there's a lot of points where I wouldn't totally trust my future in his hands," Woz added.

A further curious twist in the Jobs saga: Wozniak volunteered the information that Andy Hertzfeld was about to start a part-time job at Jobs' new company. Hertzfeld explained:

"Steve's a very persuasive character, and he decided a few weeks ago he wanted some of the people who worked on Macintosh to work with him there.

"He was able to convince me it was an opportunity to make the next great computer. And that's what I want to do in my life: make better and better, greater and greater computers.

Wozniak uses a C-Vue and considers it is "as good as they can be", given current technology. "You can see the left and the right of the screen at the same time. It's better than Apple's.

"It also has better characteristics as far as carrying, and portability. Physically it's a better arrangement the way it fits on the Apple case, and you can set it at any angle you like.

On Appletalk

Says Wozniak, "We have quite a few Macintoshes in our office. One thing we use the Appletalk network for is we have two LaserWriters. One always has letterhead paper in it, so you don't have to get up and feed paper into it by hand.

"And when a phone call comes in — the receptionist always used to take a lot of notes and messages, and you'd get 'em a little bit late. Now she can type in quick little messages and send them right to our computers. Also we send messages to her saying don't disturb me for the next two hours. We've got about to that level, but not much further.

"There's not much software around that takes advantage of the network. That which does exist tends to crash your hard disk and cause problems with the Switcher.

Hertzfeld feels AppleTalk has a lot of unexploited potential.

But, "It's not one of the problems I've been working on. I prefer to work on the interface between humans and computers, rather than between two computers. Networking is very important within an office ... I guess I just don't like offices!"

On AppleWorks

Hertzfeld described a project, apparently aban 'oned last August, to produce a vers.on of AppleWorks for the Mac. The project was initiated by Apple's Don Williams, and AppleWorks' developer Rupert Lissner had hoped to sell the program through Microsoft as MouseWorks. One reason cited by Hertzfeld for demise of the project was lack of financial incentive: AppleWorks' success had already made Lissner wealthy.

On Jam Session

The Macintosh's potential as a music synthesiser was well demonstrated by a just-released program from Hayden Software called "Jam Session".

Mac's screen shows a ghetto blaster in great detail — even down to needles waving on individual VU meters for the six separate recording tracks. There is a moving tape counter, the cassette turns around, while the tape moves from one side of the tape to the other as it is played. The mouse-driven pointer operates controls, just like the real thing.

Jam Session's sound is amazingly realistic, and a clever feature is the ability to write a melody and then tell the Mac what style you want it played in: jazz, reggae, acid rock and so on.

"It shatters the boundaries: you can't do that, but it's being done," declared Hertzfeld, who was the principal architect of Macintosh's audio software.

Hertzfeld claimed the Mac is becoming the computer of choice for music synthesists: at least seven US companies are producing MIDI interfaces to allow other instruments to connect with it. Pluses for the Mac are its user interface and portability.

On Hyperdrive

Both Wozniak and Hertzfeld use them, and consider them the best hard disk available for the Mac.

However, Andy points out that while they are the best performers and have the best software, they are relatively expensive for what they deliver, and being internally installed, if they break down, your Mac is out of commission.

On Mac's future

Very healthy, according to Hertzfeld:

"You can learn a lesson from the Apple II. Computers are different, because they are a foundation. They're not a product — they're open-ended, totally customisable by software.

"A computer has to be around a few years before it reaches the prime of its life. I still think Mac is kinda like where the Apple II was in 1979, when Visicalc hadn't yet come out for it."

On Thunderscan

"A botanist at the University of California at Berkley is using Thunderscan to take very precise measurements of the veins and capilliaries in leaves. Previously he had to use a microscope to get measurements down to 200ths of an inch or so. Very tedious. 'Now he sticks the leaf in Thunderscan, and scans it.

"He wrote his own program to analyse the image and extract the information automatically. Something I never would have thought of!

"Something that is wonderful about Apple II and Macintosh products is that everything is magnified by the creativity of the world. (The hardware) is only the start. The tens of thousands of people who are using it are always going to come up with amazing things you've never thought of yourself."

On Bill Budge

Hertzfeld says his friend Bill Budge is working on Macintosh software and on a space shuttle simulation for the Mac with true shaded details, "... that is going to be just amazing."

"He's also done his Pinball Construction Set for the Mac, and his ultimate goal in life is to write construction set construction set!"

On Desktop Publishing

Hertzfeld described two directions being pursued by manufacturers: greater resolution than the present 300 dots per inch available on the LaserWriter, and lower cost.

He sees resolution moving up to 1000 dpi in the near future, and costs dropping to US$1000. Unfortunately not in the same machine ...

Wozniak believes Apple's current priority is for low cost, rather than higher resolution.

Hertzfeld believes page layout program programs have a long way to go, but: "They'll get there over the next year or so. What you see now is only the tip of the iceberg: Pagemaker is rudimentary."

Apple II — Mac links

Hertzfeld says Apple's move to 3.5 inch drives for the Apple II family will allow easier transfer of files between those machines and the Macintosh.

"Apple is working on utility programs that will allow you to stick a Macintosh disk in your Apple II and convert files to ProDos very easily — and vice versa. That media compatibility is an important step in linking the two machines," Hertzfeld said.

"There are some other quite strange products. One actually transforms Apple II programs into Macintosh programs.

"That was a very, very difficult problem. The guy's got special hardware in the Apple II that's reading DOS references and stuff.

"The problem is that you have to run the Apple II programs through every stage you can possibly get to; you have to execute every instruction to translate the program completely. It can't work in each case — it's too hard a problem.

"With hardware cards it's certainly possible to translate Macintosh programs to the Apple II. There are cards already, but that doesn't solve the problem. You have to have correct video etcetera.

"The other thing you're now seeing is the Macintosh spirit, and the essence of Macintosh, finding its way into a variety of Apple II programs. So maybe it doesn't matter whether you can run Macintosh programs on your Apple II if the Apple II programs are as good as the Macintosh programs."

On the Amiga

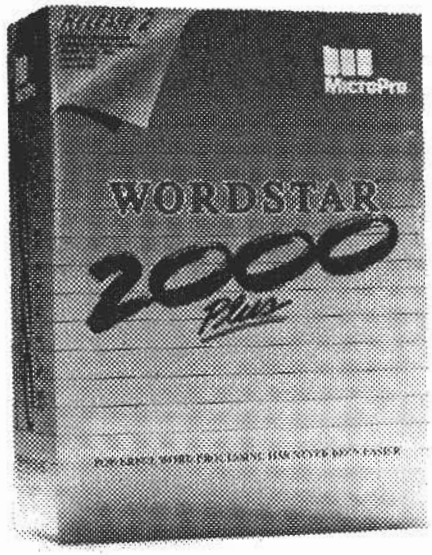
Hertzfeld has his own Commodore Amiga, but while he thinks it has great potential as a games machine, he is less enamoured of it as a general computer.

"It's kinda like a colour Mac in that it has the same processor. But the Amiga in some sense is more like the Apple II, because it is built around the NTSC television standard. It has the limitations of NTSC. It will never have the clarity of display or the number of pixels that a Mac has. In the interface mode the Amiga flickers, making it less useful as an office machine."

Hertzfeld is not impressed by Digital Research's GEM product: "The screen looks the same (as the Macintosh), but when you start using it you see the dynamic behaviour is quite different."

■

CHECK OUT THE EXPERTS' CHOICE— THE NEW WORDSTAR® 2000 PLUS RELEASE 2.



WordStar 2000 Plus Release 2 has the experts talking.

InfoCorp's Robert Lefkowits:

"WS2000+ emerges as a clear winner in overall applicability."

International Data Corporation's Jim Chapman:

"WordStar 2000 is our favorite— for ease of learning, ease of use."

But don't take their word for it. Check out the new and improved WordStar 2000 Plus Release 2 for yourself.

MicroPro®

distributed in New Zealand

by Imagineering Micro Distributors Ltd.
Available from IBM and IBM compatible dealers throughout New Zealand. Phone (09) 444-5088 for nearest dealer in your locality.

IMAGINEERING™

How to assess computer needs

In this regular column we keep the business person in touch with developments in the microcomputer industry.

The research reports are from Phil Ashton and Grant Furley at MicroLab, a "neutral" d.p. consultancy established by the accountancy KMG Kendons, in Auckland.

A common reason for computer failure is the business manager's total disinterest in the system.

A manager needs to know how to "drive" the system so that he/she can make crucial decisions as to the direction of computerisation.

The manager needs to be convinced of the benefits and to "sell" them to staff – negative reaction from the top will quickly rub off, and grind the computer to a halt.

So once you are convinced and the appropriate software package is located, then review your hardware options.

Single screen or multi-user? Some systems will let you start with one screen then move to two or three. Some won't. If you need a second screen within two years allow for it now and build it into your needs now.

Asian imports

Simply, we tread warily of the Asian-sourced PCs.

One brand in particular is proving too unreliable, and a few others also appear to lack expected standards of quality control or on-going support.

If you are a large corporate buying a 30-plus-10 pack then it's not the end of the world because mainstream processing will be on a large, reliable machine.

But if you are a small business and all your accounts are on a cheap micro and it fails, then your records are locked up and you are snookered. You could lose your machine for several days while it is being checked over.

You can't afford these disruptions. What happens to payroll? Do you ask your employees to stop eating until you can pay them?

Spend a little more for reliability.

Hard disk is essential. The price difference is nothing, but convenience is dramatic.

Forget the dual floppy unless you're an accountant.

What size hard disk? Allow for growth in your volumes and present that to the computer suppliers, and let them calculate your storage needs.

Justifying buy

Now that we know what to expect in a PC, how do we determine whether we need one.

Where do we start?)

Start by looking at areas of your business that are particularly labour intensive and ask yourself:

- are these tasks repetitive,
- is there a lot of mathematical number crunching,
- are we forever analysing figures,
- do we spend a lot of time budgeting using analysis paper, pencils and rubbers,
- do we type documents containing similar phrases time after time,
- do we find ready accessibility to our systems difficult.

OK so we have established that a computer system may be of benefit. Where to from here?

Firstly, as a businessperson you need to recognise the likely cost of computer system before you start assessing alternatives. We find, as a guide only, that a companyt ought to look at investing 1½% x turnover on a computer system. If you are a $2m turnover company then $30,000 could be your investment level.

Don't expect to pay home computer prices for a business solution.

Now we get down to setting some prerequisites before proceeding further.

An expression has been coined in the computer profession: GIGO, meaning "garbage in, garbage out". In other words, don't feed in tripe at one end and expect fillet steak at the other. This ties back to the fact that a computer system will be a disaster if existing manual systems are poor.

Be certain to get manual systems on to a good footing before introducing a computer – otherwise a computer will merely highlight existing organisational problems.

Give examples of the flow of paper from inwards goods to the operator.

We should establish three things:

1. justification for installing a computer system,
2. a rough cost figure,
3. existing manual systems being sound.

Now let's look at software.

Forget the machine at this stage, because the software will determine successful application, not the computer.

So we look at those areas of business justifying computerisation and relate them to existing software for: debtors, inventory, invoicing, creditors, payroll, product costings, sales analysis, job costings, time and cost, financial reporting, budgetting, etc. In defining the areas that we would possibly computerise we also note down existing volumes of work. For example, in debtors, note number of customers, number of invoices per day, number of month-end statements.

It is also important to note per system your needs, particularly of reports. Divide these needs into essential and useful.

Microlab helps to define these needs for our clients as they are often difficult to prepare.

All software on the market now is referred to as packaged or pre-written software.

As consultants we suggest you stay with existing software as it is: cheaper, more reliable, widely supported, available now.

With the disadvantage that it may not satisfy more than 80% of our needs, we need to find all your essential features in the software and as many useful features as possible.

In "fitting" the software we can also consider support issues, such as the "hand-holding" at the installation stage, likely upgrades and portability to a multi-user system.

Many smaller businesses are being compelled to look at computers solely because of GST.

It would be a mistake to underestimate what will be expected of you in terms of GST records and returns.

Unfortunately some of our software houses are underestimating what is required by releasing products with 'GST built-in' – which really only accounts as a sales tax calculation.

Finally, you personally do have to be committed to this project, and to making it work.

Easy word processor

Easy for first-timers

by Selwyn Arrow

If you have never used a word processor before or you have been frightened off by their apparent complexities then Easy could be just what you have been waiting for.

Recently released for the IBM PC (and clones) by Micropro, the same people who brought us Wordstar all those years ago in 1978, this package certainly lives up to its name.

Sophisticated enough for every day use, it is easy to learn; unlike its controversial predecessor which makes heavy use of the control key and multiple key strikes to achieve a multitude of functions.

Easy is completely menu driven using pop-up windows and a highlight bar to allow selection of commands from a subset of the original Wordstar commands.

Using only a subset means some more advanced edit features are not available, but for the first time or occasional user it still offers plenty.

It includes a help index and screens for each function, which can be turned off as you become more familiar with their use.

A selection of 19 editing functions in two windows are available at the press of function key 2, and a 65,000 word dictionary.

On this last item you can have as many personal dictionaries as you wish, within the limits of disk space.

A selection of personal dictionaries, each for a different topic (i.e. technical, correspondence, business) is good value.

Unlike some word processors, Easy is not limited to available RAM (from the 256K minimum) for each document, but limited only by the available disk space.

If you have been reluctant to use a word processor in the past because they are too complex (a la Wordstar) and appear to require months of use to become proficient, then Easy should suit you.

Although quite compatible internally with the three current varieties of Wordstar, it bears no resemblance to any of them in use or in its screen presentation.

It is obviously designed for small office use as it can handle one line headers and footers plus page numbering starting anywhere in a document. These use the familiar dot commands where a new line starts with a dot followed by a two letter command then comments as required.

Good and bad

After installing and using Easy to do this review I found both good and irksome points.

First up, Easy is very simple to set up on floppy disks (4 required) and even easier (sic) on a hard disk system as it leads you by the hand as it were — even setting up its own sub-directory in the latter case.

It comes with a very good tutorial, even giving typical times for working through each state.

On top of that it keeps a personal record of what you have completed, so that if you need to come back to the tutorial at a later date there are ticks on the menu next to your completed sections.

Setting it up for printing was a breeze: would you believe there are set-up details for over 125 different makes and models of printers given in the handbook.

One debatable point I found was its habit of reformatting text after I made my usual deletions and additions to earlier text. Several times I deleted several characters more than I required as the text jumped back and forth.

Fortunately this auto-formatting can be disengaged.

One design shortcoming appears when moving blocks of text. There is a limit of 750 characters able to be moved at one time, i.e. only 8 or 9 lines.

To overcome this the handbook did suggest deleting any large block of text to be moved and then restoring it to the desired position with the Restore Deleted Text menu function.

I would not like to be disturbed in the middle of such a process as all could easily be lost!

In evaluating this product I found Easy very simple to install, to learn and to use, and worthwhile value at $340 (taking into consideration its intended beginner-and-occasional-user target).

Software summary

Name	Easy
Function	Word processor
Manufacturer	Micropro
Cost	$340
Memory required (min)	256K
Copy protected	No
Tutorial on disk	Yes
Max file size (approx)	Disk capacity
Machine type	IBM PC and compatibles
Operating system	MS-DOS
Number of drives (min)	Two
Ratings:	Ease of use 4, Getting started 5, Manual 5, Value for money 5.

Review copy from Imagineering Micro Distributors Ltd.

Do you get scrambled eggs?

by Geoff McCaughan

Before we get started with Q&A, a word or two about the sort of questions we will be answering.

Questions on virtually all aspects of computing are welcome: hardware, software, programming, interfacing, and communications are our bread and butter. Some of the more esoteric queries may take some time to research, but we will do our best to provide an answer to all your questions where possible.

Regrettably, we are unable to tell you how to overcome the forces of evil in 'Attack of the Sludge Monster', and we have no idea how to escape the clutches of the mutant arkleseizure's mother-in-law in 'The Road to Frustration'. If you MUST know, we will publish your question in the hope that other readers will be able to help.

Subject: DOS
System: Commodore 64/1541
(Q) I have some disks with duplicate IDs, is it sufficient to change the ID located in the BAM?

(A) NO! The disk ID on Track 18, Sector 0 is actually part of the Directory Header, and is for the use of the directory only.

When a disk is formatted a sector header is written to EVERY track and sector (that's why it takes a while). This header contains several items of information, one of which is the disk ID. When you insert a disk to the drive, the first thing it does is loads the BAM (Block Availability Map) into drive memory, as long as that disk is used the drive knows where everything is.

The BAM is re-written to the disk every time a write file is closed.

But what happens when we change disks?

The BAM in memory then refers to a different disk, and any writes to the disk could write over existing information.

The drive has to know when a disk has been changed and this is what it uses the ID for.

When the disk reads or writes a sector, the first thing it does is checks the sector header (which is how it knows which sector it is at) and one of the things it checks there is the disk ID, if the ID is different to the current one (the ID of the BAM in memory) the BAM is immediately loaded into memory again.

Thus if we had two disks with the same ID, and we read off one, then wrote to the other, the drive would write to a free space as indicated by the BAM of the first disk, which could be space which is already used on the second disk.

When the file is closed, the BAM of the first disk will be written to the second disk, which really scrambles things up.

As you can see, unique disk IDs are vital, and duplicates should be changed without delay.

The only time duplicate IDs are (barely) acceptable is if both disks are read-only e.g. write protected program disks (and on backups of course).

The only way to change duplicate IDs is to format a disk with a unique ID and transfer all the files from one of your disks onto it. Note that the DOS never reads the ID on the directory header, so changing that will only confuse you, when you see a unique ID on the directory, and your files still get turned to scrambled eggs.

Subject: Memory
(Q) What is BANK SWITCHED MEMORY, and how does it work, and why is it used, and what are its limitations when used?

(A) Bank Switched Memory, as opposed to Mapped Memory, is becoming more common with the increasing memory sizes of today's small computers.

When the 9-bit processors in use today were designed, they all had a 16-bit address bus, which allows up to 64k of memory to be mapped. Back then a microcomputer that actually had 64k of memory was virtually undreamt-of.

But the times, they are a-changing, and 64k of RAM is as common as mud these days.

However, if your computer has 64k (or more) of RAM plus (say) 16k of ROM, and the processor can only address a total of 64k, you clearly have a problem.

The solution is to use one of a number of varying types of Bank Switching.

This is achieved by setting aside an area of address space (usually 8 or 16k) into which the 'left over' memory is switched (or paged) as required. Instead of having the memory spread out like a map, it is arranged like the pages of a book, so you can only 'see' one page at a time. By means of bank switching, a computer with only 64k of address space can have virtually unlimited memory added.

As you have doubtless surmised, there are problems and limitations with this sort of arrangement.

The most obvious problem is speed.

The extra memory not only has to be switched as required, but also needs some means of keeping track of what information is in which bank must be achieved – this processing overhead can significantly slow down an application which stores information in several banks.

There are other problems, for instance some of the latest BASICs make provision for bank switching by storing variables or graphics screens in different banks, but most BASICs require a con-

tinuous block of memory to work in, and very few other languages make explicit provision for bank switched memory.

Therefore using the extra memory makes more work for the programmer (and his program).

Subject: Terminology

(Q) Just what is meant by the term 'Masked ROM', how is it different to ordinary ROM?

(A) Masked ROM is the term used to denote ROM which has the program placed in it during the manufacturing process.

As this process is largely photographic in nature, with each layer of the semiconductor substrate being selectively etched or not etched, the selection being done with a 'mask', the derivation of the term is obvious.

The other main types of ROM are PROMs (Programmable ROM) and EPROMs (Erasable PROM). In both cases the chip is programmed after the manufacturing process, often by the end user.

The term 'Masked ROM' is usually used when it is necessary to differentiate between ROMs and PROMs of one sort or another. So, in fact Masked ROM is 'ordinary' ROM; there is no difference.

Why the different types?

EPROMs are great for equipment which may have to be customised, prototypes, or for low volume work.

Masked ROM is cheaper, but only in large quantities (several thousands) plus.

If you go ahead and order your Masked ROMs and discover a bug afterwards, you have the choice of using the bug ridden software, or throwing out several thousand dollars worth of chips. For this reason early versions of hardware are sometimes released with firmware in EPROM, and Masked ROMs come along after a few months or so.

Subject: Trig. functions
System: Apple IIe

(Q) I have found that SIN and COS give strange values that do not make sense, is this a bug, or is my computer faulty?

(A) Most likely there is no bug, and your computer is not faulty.

People get into trouble the first time they use trig. functions on a computer.

The Apple II series, and many other computers, expect an argument in radians to follow a trignometric function, whereas humans are usually used to working in degrees.

So what is a radian then?

Radians are just another means of measuring angles; degrees are a purely arbitrary form of measurement, and as arbitrary forms of measurement are not very popular in mathematical circles (no pun intended) it was decided to use a measurement that related the circumference of a circle to the radius.

A whole circle (360) degrees is equal to 6.28318530717 (2*pi) radians, and one radian equals 57.295779513 degrees.

Great, now you can't even use whole numbers to divide a circle.

Why Radians are used so often in computers escapes me, because the vast majority of programs just have to convert back to degrees. After all, 45 degrees is a whole lot more meaningful to most people than 0.785398163395 radians!

To use your trig. functions with degrees, first multiply by pi/180 thus:

```
100 PI = 3.14159265358: RA = PI/180
110 INPUT"Angle in Degrees";A
120 PRINT SIN(A*RA)
```

Finally, if your computer doesn't have a built-in pi constant, try this mnemonic – count the letters of each word to obtain pi to 7 decimal places: "How I Wish I Could Enumerate Pi Easily".

Subject: Boolean Logic
System: Commodore 64.

(Q) How can I do an Exclusive OR in Basic?

(A) Two ways:

1. Do the XOR in machine language.

```
100 REM Setup the ML
110 Data 77,13,3,96
120 FOR X = 679 to 682:READ Y:
        POKE X,Y:NEXT
900 REM Do the XOR
1000 POKE 780,A: POKE 781,B: SYS
        679:C = PEEK(780)
```

2. If you MUST use Basic, try this.

```
1000 C = (A OR B) AND (32767-(A
        AND B))
```

In both cases line 1000 is the equivalent of C = A XOR B. Of course you could use a REAL language and you won't have the problem.

Subject: Declaring Variables

(Q) What is meant by the term 'declaring variables', and why is this necessary?

(A) Firstly, it should be noted that in most Basics, variable declaration is not necessary.

However in some versions of Basic it can be advantageous to assign frequently used variables first. These variables will then be located at the start of the variable table and can be accessed faster consequently.

When this is done you will see a line at the start of a program like this:

```
100 A=0:B=0:C=1:T=0:X=10
```

It should also be noted that most Basics initialise variables to zero, i.e. the first usage of a variable will find a value of zero if a value has not previously been assigned. This is by no means a universal rule.

The one time you must declare variables from Basic is when dimensioning arrays, the statement

```
100 DIM X(100)
```

tells the interpreter to assign a certain amount of array space for X().

The situation is considerably different with a compiled language. Normally a compiled language requires explicit declaration of all variables, constants and data before the beginning of the program.

Examples:

The Pascal VAR declaration:

```
VAR A,B : REAL;
  I,J,K : INTEGER;
  TEST : BOOLEAN;
```

Declares variables A & B as real, I,J, & K as integer and TEST as boolean (i.e. either true or false).

The PROMAL global declaration:

```
CON FULL PAGE = 40
CON VECTOR = $02C7
BYTE VIDARRAY [54]
BYTE SYNBYTE
BYTE TSFLAG
INT PAGE
WORD WSPOINT
DATA BYTE POWER2 [] = 0,2,4,8,16,
        32,64,128
```

Declares two constants, FULL PAGE and VECTOR (constant type is implicit), a 54-element byte array, two byte variables SYNBYTE and TSFLAG, an integer variable PAGE, and a word variable WSPOINT (both two bytes). Finally a DATA declaration specifies a byte array POWER2.

Note that the DATA declaration alone suffices to initialise the array POWER2 without the need for a READ loop as would be required by Basic.

The compiler is also smart enough to count the data elements, so there is no need for an array dimension.

Comal DIM declaration:

```
DIM link$ OF 2
DIM validkey (32:90)
DIM filesize (1:144)
DIM filename$ (1:144) OF 16
```

Comal is a little different.

String lengths must be declared, as in link$, the following three declarations are for arrays.

Arrays may be dimensioned not only for size, but also for the required starting and ending indices.

The string array dimension is followed by the string length.

Comal does not require declaration of other variable types, but does require explicit variable and constant assignment.

All three languages I have mentioned here allow local variables, it is usual for local variable declarations to be made in the same manner as globals, but the declaration occurs at the start of the procedure or function to which they are local.

Now all this probably sounds like an awful lot of work to go to just so your program knows what variables it is supposed to be using, and for someone who has only ever used Basic it is.

But in the long run the declaration requirement becomes second nature and it can save a lot of problems when it comes to deciding if a variable has been used before or not.

In addition, it is worthwhile remembering that variable declaration goes a long way to making a compiler more efficient and therefore faster, a point that will not be lost on anyone who has used compiled languages to any extent. ■

NOW YOU DON'T HAVE TO CHOOSE BETWEEN DOT AND DAISY.

Now there's C.Itoh's new 1570SC Series — the printer that does everything!

Accounts processing in 200cps draft mode.
Prints spread sheets and graphics in 7 colours.
Correspondence at 133cps.
Letter quality at 66cps with a choice of 7 font cartridges. (Makes changing the characters easier than changing a daisywheel.)
Colour highlights correspondence – e.g. for direct mail.
Dual mode push-in/pull-out tractor feed standard.
Optional Automatic Sheet Feeder.
Suitable for all computers. Centronics or RS-232-C Interface (+ Apple Macintosh/Imagewriter Compatible version).

The performance of a dot matrix printer, the quality of a daisywheel and a price that leaves you no choice. C.Itoh's 1570SC – the ultimate printing machine. From Control through New Zealand's biggest dealer network.

Contact us now for the name of a dealer near you.

CONTROL

P.O. Box 68-474, Auckland, N.Z. Telex NZ 61102 'DATASYS'
45 Normanby Road, Mt Eden, Auckland 3. Ph (09) 600-687.

CLAUDE 3127

Grappling with 3-D graphics

by Dick Williams

This month I want to explain the use of matrix transformations for 3D graphics. This is a bit complicated but the subject of computer graphics is such an important one that it is well worth spending a little time coming to grips with the underlying mathematics of the subject.

Last month I showed how to alter a 2 dimension shape on screen with movement scaling and rotation about the centrally positioned X,Y axis. The method used was to erase the shape on screen then to alter the X and Y values for each point, and to redraw the altered shape on screen by joining up the new points.

If the shape had to be moved 30 pixels to the right all that was needed was to add 30 to each of the X co-ordinates and redraw, and the shape was moved the required distance. The same method of direct control (using equations) was also used to obtain scaling and rotation.

The method I used is good for showing the basic principles of shape manipulation and getting going, but is limited in scope for more complex drawing such as 3D graphics.

Before getting into the details I should mention that most home computers are not fast enough or have sufficient memory on board for acceptable real time 3D graphics. Some models with fast basic can almost create the impression of realism, but this is only with simple wire shapes and it's not until you get up into high speed 16 and 32 bit units that you can get better graphics and that's only by pushing everything to the very extreme of the computers ability.

The next step up to custom machines made specially for high speed graphics drops the bank balance to a large minus figure and even then there are limitations on the performance obtainable.

An ordinary colour television set is capable of reproducing very lifelike images when receiving pictures from the tv stations. These images are transmitted at the rate of 50 half-pictures or 25 total pictures every second. This transmission rate is sufficient to show a smooth movement picture that is presented to our eyes every 25th of a second.

Considering their low cost, computers can produce good images also, but there is a "wait time" while the computer calculates the next image ready for display by the tv or monitor.

3D graphics requires an ability to create an illusion of depth.

To this effect we must establish (literally) a point of view and 3-D impressions, but on a 2-dimension plane (the screen).

Drawing a realistic looking apple on a piece of paper requires you to draw in three dimension, you have to draw across the paper (the X dimension), you have to draw up and down the paper (the Y dimension) and you have to draw into the paper and out of the paper (the Z dimension). As it is not possible to actually draw into or out of the paper, your drawing must create the impression that you have done so.

When you draw a 3D object on screen you have to use a method of TRANSLATING the three co-ordinates of a point (X,Y,Z) into 2 co-ordinates (X and Y).

How do we go about handling this translation, how do we look after the "point of view", how do we relate the X and Y pixel values with real world units of measurement?

The answer is easy: we use "matrix transormations".

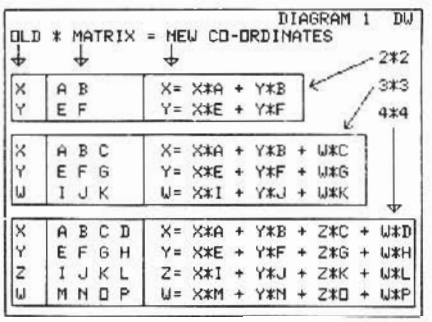
Matrices (plural of matrix) are available from the maths books which will handle scaling or rotation or translation (movement), one at a time or combined into one matrix to handle all three or more operations.

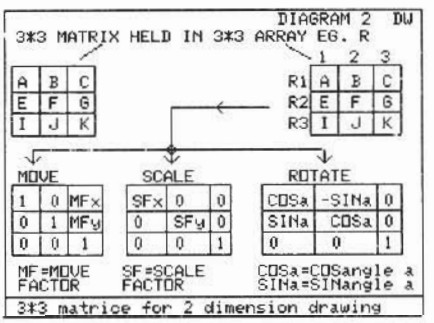
Diagram one shows three matrices, the first and simplest being a 2 by 2. This would be quite satisfactory for 2D except that it won't handle movement.

For movement we need 3 columns *and it would be possible to have a 3 by* 2 matrix, but this is not considered good maths, so we add another row and end up with a 3 by 3 matrix. This enables us to calculate the new X value, the new Y value and a value for W which in 2D graphics is not needed. The last one is a 4 by 4 matrix suitable for 3D graphics.

Diagram two shows how the 3 by 3 matrix for 2D graphics is arranged for movement, scaling, or rotation. Computers don't start out with matrices built in, but a directly equivalent implementation can be obtained with an array such as, DIM R (3,3).

The array R has been defined to have 3 columns across and 3 rows down with a total of 9 cells altogether just like a 3 by 3 matrix. The next step is to place



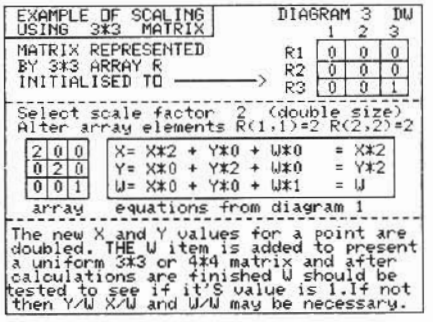


Basic Keywords for the Apple III

Eddie Adamis Wiley.

Books about that unfortunate citrus fruit, the Apple III, are quite rare – as are the computers themselves, so this title is unlikely to have mass appeal. It contains one page explanations of every Basic statement supported on the Apple III, and does a very capable job of explaining them.

– Mike Wall



suitable values in each cell for movement, scaling or rotation as shown in diagram 2 and multiply the old X,Y values by the values held in the array in the manner shown in diagram 1 and you have a new X and Y value for a point plus a spare W which is not used.

You have to do this for point 1 and point 2 and as many points as the shape has. You can start to see the amount of calculation required of the computer.

Diagram three shows a worked example in 2D graphics for scaling by 2 (doubling in size).

The 3 by 3 array is initialised (set up from start) to hold the values of 0 except for the bottom right cell which has 1 placed in it.

The scaling factor of 2 is placed in the appropriate cells of the array, and the new X and Y values are calculated.

The new X,Y values turn out to be twice the old X,Y values which is what you would expect for a doubling of size.

The text at the bottom of diagram 3 describes how the W value may need testing after calculations have been completed.

This is not necessary for 2D graphics and the W value can be ignored but it does come into play in 3D graphics.

A short program is included to show a 3D shape (a cube) on screen. The program lets you try out different perspective views of the cube to see which looks the most matural, and adjustment is by the up/down and left/right cursor keys.

```
10 REM 3D CUBE                                    DW

20 SCREEN 2,2:POSITION (105,75)
30 X=500:Y=500:Z=4000 :                           REM

100 REM CUBE POINT AND LINE DATA
110 DIMX(20),Y(20),Z(20),S(20),F(20)
120 REM POINT DATA--------------------
130 DATA 0 ,0 ,0
140 DATA 0 ,0 ,75
150 DATA 0 ,75,0
160 DATA 0 ,75,75
170 DATA 75,0 ,0
180 DATA 75,0 ,75
190 DATA 75,75,0
200 DATA 75,75,75
210 REM LINE  DATA--------------------
220 DATA 0,4,4,6,6,2,2,0,1,5,5,7
230 DATA 7,3,3,1,0,1,4,5,6,7,2,3
240 REM READ X,Y,Z POINT DATA--------
250 FOR P=0 TO 7
260 READ X(P),Y(P),Z(P):NEXT
270 REM READ LINE START AND FINISH---
280 FOR P=0 TO 11
290 READ S(P),F(P):NEXT
300 DIM A(20),B(20):                              REM

400 REM CURSOR KEY CONTROL-----------
410 CURSOR-90,95:PRINT "X= 500 Y= 500
  PRESS CR TO REDRAW OR N
420 Y$=INKEY$
430 IF Y$=CHR$(28) THEN X=X-100
440 IF Y$=CHR$(29) THEN X=X+100
450 IF Y$=CHR$(30) THEN Y=Y+100
460 IF Y$=CHR$(31) THEN Y=Y-100
470 IF Y$=CHR$(13) THEN 600
480 IFY$="N"THENX=500:Y=500:GOTO600
490 CURSOR- 90,105:PRINT CHR$(5);"X=";
X ;" ";"Y=";Y
500 GOTO 420 :                                    REM

600 REM TRANSFORMATION OF POINTS-----
610 FOR P=0 TO 7
620 A(P)= X(P) * Z + Z(P) * X
630 B(P)= Y(P) * Z + Z(P) * Y
640 W=Z(P)-Z
650 A(P)=A(P)/W +50
660 B(P)=B(P)/W +50 :NEXT:                        REM

700 REM DRAW CUBE--------------------
710 CLS:FOR P=0 TO 11
720 S=S(P):F=F(P)
730 LINE(A(S),B(S))-(A(F),B(F)),1
740 NEXT :GOTO 400
```

256K and beyond?

by Harvey Kong Tin

For those of you who cannot afford an Atari ST – you can think about increasing the memory of your 8-bit computer.

If you have an Atari 800XL (or 1200XL), there is an upgrade called Rambo XL which will increase the memory of your computer from 64K to 256K, it is available from ICD – the Spartados company.

Installation should be done by someone very experienced with hardware modifications.

The upgrade itself consists of a small circuit board.

Existing 8K chips are removed (some 800XLs have them soldered in, which means it can be time consuming to get them out) – if they are socketed, then it's no problem.

They are then replaced with the 256K chips (correct handling must be observed or else you can destroy them easily).

A chip is replaced with the Rambo board.

Jumpers and a ribbon cable are connected.

With careful installation, it is possible to reverse the process – if you wish to change your computer back. You may like to hang on to your old memory chips for this reason.

Full instructions are provided.

Compatibility

Once you have it up and running, you will find it compatible with the existing RAMDISK.COM file on DOS 2.5, which only provides you with a 64K Ramdisk – like the 130XE.

My board extension has already tested the Basic XE, Synfile+ and Paperclip, and all functions as with a 130XE.

Paperclip can be configured to use the full memory, according to its manufacturer's claims.

Rambrandt, the drawing program, works OK storing screens in the extra memory. Only Basic XE will allow you to use the extra memory for bigger Basic programs – normally there is only 32K free to use.

Rambo XL claims compatibility with the 130XE in CPU mode and not Antic mode.

There have been programs demonstrating the Antic access mode in Antic and Analog which flip into the extra memory – these will not work on Rambo.

If you get flickering with a program, this can be avoided by keeping the display list out of $4000-$7FFF.

So far as I know, there is no commercial program using Antic access on the 130XE – it's not a very efficient way of using the extra memory, as using it via ramdisk allows for compaction of screens.

ICD is a company which apparently supports an upgrade policy, so if there is a need for improved modifications to Rambo XL, they could provide it.

Essential DOS

Spartados is essential to set up the extra memory as a 192K Ramdisk.

You will need a fast and powerful DOS like Spartados to move files around conveniently. The new ramdisk file RD.COM sets it up, and SCOPY.COM can copy at high speed (via reading tracks, not sectors).

Rambo XL 256K upgrade

Before getting Spartados it is recommended that you buy the US Doubler 1050 upgrade first, because you get the latest Spartados with it. This hardware upgrades the 1050 to true double density and provides a high speed skew alignment mode for use with Spartados.

Again – the US Doubler must be fitted by someone experienced with hardware mods – full instructions are provided. A 180K disk drive and a 192K ramdisk makes sense, rather than staying with a standard 130K disk drive.

MS DOS and TOP DOS are reported to be supporting the Rambo XL upgrade too, according to ICD.

130XE owners need not sell their computers to upgrade to more memory either, as it is possible to upgrade an XE to 320K with a 256K ramdisk.

But so far no company markets such an upgrade.

However, there is already the appropriate Ramdisk support file on the latest Spartados, called RD260.COM.

For programmers

Those who have used a 130XE (I previously owned one) – will know how great it is to use a Ramdisk. However 192K is a much more useful area than 64K to use.

Assembly Language programmers in particular should appreciate the speed involved when you assemble from and write to a 192K Ramdisk for your large source files.

There was an article which appeared in the Sept 1985 issue of BYTE magazine, about how to upgrade a 800XL to 256K. Full details were provided. Unfortunately it did not claim compatibility with any 130XE software.

Rambo XL sells for US$49.95, and the 256K chips are available for US$30.00 extra. They are available from: ICD Inc, 1220 Rock Street, Rockford, IL 61101-1437, United States.

NOTE: You should be able to buy the 256K DRAMs locally, but first buy the upgrade to find out what type are required!

Deletions and removals

by Savern Reweti

These mini programs or subroutines will enhance your programming ability. Also they will enable you to overcome any shortcomings that Atari Basic might have.

One major problem I have had while programming in Atari Basic has been the lack of a DELETE function. Atari Basic will quite happily allow you to delete a single line at a time but has no capability to delete a whole block of lines.

Therefore I have produced a program that will do the job.

Type it in carefully then list it to disk or cassette (ie LIST C: OR LIST D:).

Then when you have loaded the program you wish to work on, ENTER the DELETE program and it will merge with your main one.

To use it simply GOTO 32000 and answer the prompts. When you have completed your main program and wish to save it, GOTO 32100 will erase the DELETE program.

The next program will delete all Rem's from your BASIC program.

Remember that when you write your program you must ensure that there are no GOSUB or GOTO's that are directed to a REM statement.

This program works the same as the first, you must load your main program and then ENTER this program.

When you have completed your main program and wish to remove all the REM's then GOTO 31500, GOTO 31515 will erase the REM remover program.

```
32000 REM PROGRAM LINE DELETION
32005 GRAPHICS 0
32010 TRAP 32010:POKE 84,11
32012 ? "DELETE":? "START NO";:INPUT STA
RT:? "END NO";:INPUT EN:? "STEP";:INPUT
STEP:ST=START
32020 IF INT(START)<>ABS(START) OR START
>31999 THEN ? CHR$(253):GOTO 32010
32030 IF INT(EN)<>ABS(EN) OR EN>31999 OR
 EN<START THEN ? CHR$(253):GOTO 32010
32040 GRAPHICS 0:? :?
32050 ? START;START=START+STEP
32060 ? "CONT":POSITION 0,0:POKE 842,13:
STOP
32070 POKE 842,12:IF START<=EN THEN 3204
0
32080 GRAPHICS 0:? "LINE NO ";ST;"-";EN;
" DELETED":END
```

```
REM REMOVER  PG 1

31490 REM # REM REMOVER #
31500 TRAP 31514:CLR :OPEN #1,12,0,"S:"
31501 S=PEEK(136)+256*PEEK(137):POKE 752,1:DIM B$(129),B$="
":B$(129)=B$:B$(2)=B$
31502 K=3:L=PEEK(54)
31503 T=PEEK(S)+256*PEEK(S+1):IF T>32767 THEN CLOSE #1:END
31504 IF PEEK(S+K+1)<>0 THEN 31512
31505 ? CHR$(125):POSITION 2,4:LIST T
31506 POSITION 2,4
31507 GET #1,T:IF T<>82 THEN 31507
31508 GET #1,T:IF T<>69 THEN 31507
31509 GET #1,T:IF T<>77 THEN 31507
31510 ? "{4 CTRL}";B$;:POSITION 0,0:POKE 842,13:POSITION 2,10:?
"CONT":POSITION 2,2:STOP
31511 POKE 842,12:GOTO 31502
31512 K=PEEK(K+S):T=PEEK(K+S-1):IF T<>22 AND T<>155 THEN 315
03
31513 S=S+L:GOTO 31502
31514 ? "ERROR #";PEEK(195)
31515 POKE 752,0:? "{CLR}":POSITION 2,4:FOR X=31500 TO 31516:? X
;NEXT X
31516 POSITION 2,21:? " POKE 842,12":POSITION 2,0:POKE 842,13
```

Identity Quest

by B.A. Bridger

Adventure games don't normally appeal to me but I have become fascinated with this one.

The aim is to find your name, which you have forgotten after waking in a strange place.

While searching through 'The Temple of Sezeen' 'The Caves of Purb' 'The Ghoulish Coolish Greenish Forest' etc there is treasure to be found and traded, monsters to fight or run from, and at intervals the necessity to replenish your food and drink supply.

Perhaps more use could have been made of visual and sound effects but these are probably regarded as distracting by the true adventure game enthusiast.

A good feature is that any time an illegal command is entered a list of the correct commands is displayed.

The list of commands available to the player includes the usual ones for movement N S E W, eXamine, Drop and Get for dealing with objects, various ones (including a secret weapon) to use when confronting Monsters, and Eat, Drink and Inventory.

The game can be saved to tape or disk at any point for continuation at another time.

Continuing interest in the game is maintained by the different character of the game at different levels.

Iquest is available on tape ($24.95) and versions are available for SV-328, expanded SV-318 and MSX computers. The program is marketed by Action Computers, Wellington South.■

Program writing is child's play

by Gary Parker

There are not many new Spectrum books being published any more, due mainly to the fact that books on most subjects concerning the Spectrum are already available.

But I have noticed an increasing number of books aimed at children appearing, so this month I'll take a look at a few of these.

Write your own programs

by John Parry. Magnet Books. $4.95.

This little 70-page book is designed to teach children computer programming. It explains programming in fairly simple language, giving lots of examples.

No target age-group is mentioned, but I'd say it would be most suited for 8 to 16 year-olds.

The type used is fairly small, so children at the lower end of that age range would have to be keen readers.

"Write Your Own Programs!" is designed to work with most computers, but since this is a British book, the Spectrum is concentrated on.

This does mean that there are some passages irrelevant to Spectrum users, and which may be confusing to children. But usually brand differences are well explained.

Often a paragraph explaining the variations between computers is followed by a paragraph specifically for Sinclair users.

The book begins with an explanation of how to use a keyboard, and leads into a step-by-step guide to programming.

Each section explains a particular facet of programming in a clearly-written, logical sequence which children should find easy to understand.

Since learning to program is hard work no matter which way you present it, the book will probably be most useful if adult help is available.

I recommend this book to any Spectrum-owning parent with children, and to teachers.

Games for your ZX

by Peter Shaw. Virgin Books. $8.95.

This is a book of twenty-four game program listings which you can type in and run. The programs consist of Basic listings two or three pages in length – short enough for children to type in.

The listings are made on a ZX printer, but they have reproduced fairly well and shouldn't be difficult to read.

The book concludes with a short eight-page section on how to write better programs.

This section explains how to come up with an idea for a game, how to structure this into a set of tasks, and how to turn these tasks into a program.

While much of what is said will be more or less common sense to many people, it may be just enough to help a beginner click on to the idea.

Many books explain how to program, but few explain how to turn a problem (in this case a game) into a program.

As for the games, they are of reasonable quality (you can't expect too much from short Basic programs).

I suspect that children used to commercial programs may be a little disappointed.

But if this book gets kids involved in programming rather than just playing commercial games, then it will have served a useful purpose.

The book would have been improved if the games had been accompanied by explanations of how they worked, because as it stands it is little more than a collection of the sort of programs available from magazines.

The Bytes Brothers

by Lois & Floyd McCoy. Armada. $4.95.

This is part of a series of books aimed at children who are interested in computers.

The two I have seen are "The Bytes Brothers Record a Robbery" and "The Bytes Brothers Go to a Getaway".

Each book contains several fictional short stories about the Bytes brothers and the adventures they have.

The brothers use computers to help them solve mysteries, ,and the Basic programs they use are listed in the book.

The programs are also explained, so these books not only present an interesting story but teach programming as well.

You might think such an unlikely combination could not be successful, but I am amazed at how well the programs are integrated into the stories.

At the end of each story, the reader has to try and work out how the Bytes brothers solved the mystery. Then a turn of the page reveals all.

To give an example, in one story the Bytes Brothers help an archaeologist date some bones by writing a program which averages the amoung of lead found in the bones.

At the end of the story, the reader has to guess what the results mean before turning the page and finding out how the brothers interpreted them.

During the story, the program is listed and explained by the brothers.

I think these books are winners. They're well-written, interesting, and high on reader involvement. What kid interested in computers could resist them?

The Puffin dictionary of computer words

by Robert W. Bly. Puffin Books. $6.95.

As the title implies, this is a dictionary of computer jargon.

If you often come across words in computer publications which you don't understand, this book would be invaluable.

It lists every imaginable word associated with computers, from Abacus to Zuse, in a clear and often entertaining way. (What is a Zuse, I hear you ask? Konrad Zuse built the first computer to use binary code).

The entries are clear and helpful. For example, under the entry Binary, you are not simply told what binary is, but taught how to perform binary addition as well.

This book is not especially aimed at children, but I mention it here because its readable explanations and amusing cartoon drawings would make it also useful as a child's reference book.

Tips on shrinking programmes

by Don Stanley

You have read in last month's Bits and Bytes that the Spectravideo importer/distributor CDL, has ceased trading.

What does this mean for the SVI owner in New Zealand?

I spoke to Peter De Zwart (formerly CDL's SVI product manager) and he informed me another New Zealand company is trying to obtain the SVI distribution rights. Meanwhile MSX owners can seek support from South Auckland Computers, where Tom Johnson has bought SVI stocks from CDL.

Now the bad news for 318/328 owners: SVI has discontinued production of the computers and peripherals.

For recent buyers of cassette systems this will make expansion a little more difficult, however a number of people are moving from 8 to cheap 16-bit hardware, so keep an eye out for second hand SVI bargains.

Software-wise both Action Computers and Pandasoft International locally support the SV318/328 and MSX.

There is a large user base for the 318/328 in New Zealand, and I suggest people consider joining a users group for sourcing information.

My bias is the Wellington group because its newsletter is regular and useful, and offers technical expertise.

Cramming

A common question is how to write BASIC programs which grow outside of the 29k (21k for disk users) size limit. Often only a few more bytes are needed to complete the program, or maybe the program is complete but will not run in the remaining space.

It is nothing unusual in programming to have to consider whether you need to sacrifice efficiency for space, particularly on a micro.

Sort method X may be particularly fast but uses 3 times as much space as a simple bubble sort.

This article considers ways of fitting in programs by using features of BASIC.

Defining variables

The first consideration is how to define variables.

For numeric variables BASIC will always assume them to be double precision unless you tell it otherwise. Double precision means BASIC uses 8 bytes to store the value of your numeric variable.

But if your variable only uses integers, it's value can be stored in 2 bytes.

If you don't need the high amount of precision which 8 bytes gives, you store the variable as single precision, which uses 4 bytes of storage for the value.

To define a variable to take only INTEGER values, use either a DEFINT instruction or place a % after the variable name. The difference between the two instructions is that DEFINT needs a letter after it, and the instruction makes all variables starting with that letter be integer valued, while placing a percent sign after a variable name forces just that variable to be integer.

```
DEFINT X all variables starting with an
           an X will be INTEGER
           unless forced otherwise
XZ%=10 – only variable XZ will be
           integer
```

Forcing a variable to be SINGLE precision is similar. A DEFSNG instruction can be used, or place a ! after the variable name.

```
DEFSNG X – all variables starting with
           an X will be SINGLE PRE-
           CISION unless forced
           otherwise
XZ!=3.13 – only variable XZ will be
           single precision
```

For programs with lots of variables, a little thought can save a lot of space. Often you can reuse a variable somewhere else in your program, after using it at an earlier point.

A prime example is variables which exist solely for use in loops. Perhaps your program has a number of loops and you use a different variable as the loop counter in each. 20 loops would see 20 variables used and of course would require space for each of them.

Provided your loops never need to call a subroutine with another loop, you can use the same loop variable for each.

I find it useful to call my loop variables L1, L2, L3... Generally I only need L1, but if L1 calls another loop I need L2 as well and so on.

At this stage lets have a quick look at how BASIC stores values.

When you run a program an area of memory is set aside called the variable table. This always begins 2 bytes after the end of your program.

As each variable is encountered it is added to the variable table. For an integer variable, say X, the table looks like this (X = 648)

```
B1   B2 B3 B4 B5
2    X     88 02     (hex)
```

B1 (Byte 1) is the variable type and will be 2 for integers, 4 for single precision, 8 for double precision and 3 for strings.

B2 and B3 are the variable name. B3 is a null byte here (ascii 0) since only one character is used.

For integers B4 and B5 are the integer value in hex with the bytes reversed, 0288h = 648. Note that integers are restricted to values between –32768 and 32767.

B1 to B3 have the same meaning for INT, SNG or DBL numeric variables. For single and double precision variables B4 refers to the sign of the number and also its magnitude. The rule for B4 is:

If B4 > 127 the variable is negative

If B4 < = 127 the variable is positive

and

If B4 < = 127 there are B4-64 digits before the decimal point

If B4 > 127 there are B4-192 digits before the decimal point.

Thus if B4 is less than 64 the number is between 0 and 1; if B4 is between 64 and 127 the number is greater than 1; if B4 is between 128 and 192 the number is between 0 and -1, and if B4 is greater than 192 the number is less than -1.

```
eg X! = -2713.03
B1   B2 B3 B4 B5 B6 B7
4    X     C4 27 13 03
```

B4 is C4 (hex) so we have a negative number less than -1, and since C4 (hex) is 196 (decimal) we have 196-192=4 digits before the decimal place. Thus the number is -2713.03

```
eg X = 542.3654764 (double precision)
B1   B2 B3 B4 B5 B6 B7 B8 B9
8    X     43 54 23 65 47 64

B10  B11
00   00
```

B4 is 43 (hex) so we have a positive number greater than 1 and since 43 (hex) is 67 (decimal) we have 67-64=3 digits before the decimal place. Thus the number is 542.365476400.

That's how Basic stores your numbers, to find the start of the variable table type ? HEX$(256*Peek(&HF7EF) + PEEK (&HF7EE)). MSX users would type ? HEX$(256*PEEK(&HF6C3) + PEEK (&HF6C2)).

Now that you know how BASIC stores numbers you should be able to see the considerable saving in space that can be accomplished by using integers and singles where appropriate, and by not carrying around too many variables (which could be done away with).

Line numbers

The next suggestion for saving space concerns the line numbers.

You do not need to start each BASIC statement on a new line – doing so uses

5 bytes of memory per line number.

Furthermore it can lead to faster programs to put as many statements on one line as possible, because BASIC does not have to update its line pointer area as much.

Up to 255 characters may be placed in a single line number.

Separate Basic statements on a single linenumber by colons.

e.g.

```
100 PRINT "Hello"
110 INPUT "Enter Your Name";NA$
120 IF NA$="" GOTO 100
130 PRINT "Have A Good Day";NA$
140 STOP
```

uses 25 bytes overheads for line numbers while

```
100 PRINT "Hello": INPUT "Enter
    Your Name";NA$:IF NA$=""
    GOTO 100 ELSE PRINT "Have A
    Good Day";NA$:STOP
```

uses 5 bytes for line number overheads.

The first program uses 108 bytes of memory, the second uses 93 bytes.

Blank spaces

The above example leads to another space saver – removing blanks.

You don't need spaces between BASIC keywords, it makes your program look a bit messy, but you can save a lot of space by removing blanks in large programs.

By the way, observe in the above example that the IF has no THEN on but just a GOTO. You do not need to type THEN GOTO in BASIC.. another byte saved!

REM markers

The REM statement can be a bit of a gobbler space-wise. It's good programming practice to use REM as a reminder of what's been going on, but try not to overuse it.

Furthermore, wherever possible avoid using the ' as a substitute for REM – it needs 3 bytes while REM needs only 1.

Print calls

This next idea is a space saver which can also speed up your program in some circumstances (large amounts of text printing on screen).

Suppose you have a series of PRINT statements like this:

```
10 PRINT TAB (15) "MENU"
20 PRINT
30 PRINT "1 – LOAD DATA"
40 PRINT "2 – SAVE DATA"
50 PRINT "3 – SEE FILES"
60 PRINT "4 – EXIT"
70 PRINT
80 PRINT "ENTER NUMBER"
```

We know now that they can all go on one line, saving 35 bytes from the line number overheads. But we only need 1 PRINT statement!

Compare the above with this...

```
10 LF$ = CHR$(10) + CHR$(13):
PRINT TAB(15) "MENU"LF$LF$"1
–LOAD DATA"LF$" 2–SAVE DATA
"LF$" 3–SEE FILES "LF$" 4–EXIT
"LF$LF$"ENTER NUMBER"
```

This program uses only 1 call to the rom PRINT routine. The previous program uses 8.

Thus BASIC does not need to jump round in the rom finding the PRINT routine, setting up stack entries and so on, more than once.

The LF$ variable causes a linefeed and a carriage return – exactly what typing PRINT does.

Note that the first program requires 178 bytes of memory while the second needs 153. Note too that when using LF$ in the PRINT we do not need to precede or follow it with a semi colon – PRINT does NOT need semicolons around character variables.

Those are some useful ways to save memory. Next month I'll try to follow on the same theme. These ideas apply to both SVI and MSX, indeed similar suggestions apply to most versions of BASIC.

Easier on the eyes

The VDT operator problem of eye-strain through light 'bounce-back' from screens has been recognised for some years, and in the USA, several states have introduced legislation regarding the responsibility of employers in counteracting health hazards associated with VDT operation.

Vision Enhancement NZ Ltd's CP-70 is a circular polarizer, which is claimed to be more effective than the linear type of filter screen, acts as a 'light-trap', increasing contrast without the fuzziness that is a major contributing factor in eye- strain.

The Polaroid screens have been installed in most government departments.

CRTronic WPI V2.5
characters 000869
errors tte 00
pe 00 fe 00

IBM fingertrap subroutine

Some readers who have IBM compatible machines running GW Basic may have encountered a little problem which I found recently.

The problem with Basic programs was to devise a routine to detect an erroneous input caused by prolonged holding down of the ENTER key. This would usually occur between successive inputs.

A common ploy is the following:

```
10 IF INKEY$<>"" THEN 10
20 IF INKEY$="" THEN 20
```

Program execution halts at line 10 until you take your finger off any key you happen to be pressing. Control then stays at line 20 until you again press a key.

When I tried this, which worked well on my previous computer, it didn't work – line 10 appeared to be ignored!

The problem seems to be that the keyboard does not give a continuous signal but a series of intermittent ones separated by "null" signals.

The computer does indeed respond to line 10 but in a fraction of a second the condition is changed and so control passes to line 20 giving the impression that line 10 was ignored – and of course rendering the subroutine useless.

Once the problem is recognised it is an easy matter to change to the following form which achieves the desired effect:

```
10000 REM Fingertrap***
10010 REM The counter limit should
          not be reduced much
          below 200
10020 FOR N=1 TO 200: IF INKEY$
          <> ""THEN N=0
10030 NEXT N
10040 IF INKEY$="" THEN 10040
```

This subroutine causes a slight delay in the execution of the program and I wonder if there is a more efficient solution.

–R.G. Bain
Paraparaumu

Home spreadsheet blues

by Murray Miskelly

A new addition to the home-computer spreadsheet is Practicorp International's Practicalc II, a spreadsheet written for either the Cat or the Apple computer.

Other versions are available for the Commodore 64 and the B.B.C. Micro.

The programme creators have endeavoured to not only equal Visicalc, but surpass it's features.

But to begin with, the manual, although widely comprehensive, has poor facilities for those inexperienced with spreadsheets.

This is a real dissappointment while Practicalc itself appears to offer so much.

The advertising for it also claims that Practicalc offers word processing, database and graphics capabilities, which I considered an exaggerated reference to simply storing alphanumerics in the spreadsheet cells.

You could store entire sentences in cells, but this constitutes very rudimentary word processing.

In the same regard, the nearest I could get to "graphics" was to manually place astericks in cells to simulate a histogram.

Unusual

An unusual feature for this level of spreadsheet was the command '/X' or 'Sort', to allow columns (not rows) to be sorted in alphabetic or numeric order.

The program prompts for co-ordinates for the start of the search and uses the cursor for the sort-section terminator.

Multi-column sort is a further refinement by which spreadsheets with identical entries in certain cells (mailing lists are a good example) can be sorted again into a second column. This is clarified in the manual.

This copy of Practicalc II was the Cat version – very similar to the Apple version except that entry of option commands can be accomplished in single keystrokes with the function keys.

This fact can be a time saver but the relevent information is almost hidden in Appendix D under the title 'Laser 3000', which is the US name for our Cat.

A better approach would have been to release with the Cat version a cardboard overlay to sit on top of the keyboard as a reference to function key options.

I feel the power of Practicalc II is likely to meet home programmer needs, like developing budgets and tax-return estimates.

Future copies of the manual could/should include a tutorial for unexperienced spreadsheet users. Similarly, a key-reference overlay would speed up the initial learning of commands.

Practicalc II was supplied by Dick Smith Electronics ■

Well presented editor

by Murray Miskelly

Of all uses of the micro-computer, word processing has proved to be the third most popular software package following business management programs and games.

And of all word processing packages the ones that survive are those that are designed for the most common computers.

This is the case with Sandy's, a program originally written for the Apple Computer and now modified for the Cat (or American Laser 3000).

The program comes in a padded bound folder with three ring-binder clips so that the manual lies flat on any page that you are using. With this you also receive two copies of the Sandy disk (double-sided), two quick reference charts and two cutout overlays to sit above the Cat keyboard.

In comparison to virtually all of the Apple programs that I have used or tested this piece of software has a very comprehensive manual and instructions. (As mentioned above the folder that it comes in is robust, practical and easy to use.)

Chapters included cover the use of the manual, an introduction to word processing, a full tutorial detailing the use of the package and more advanced editing features.

The tutorial refers to two sample programs on the disk that contain examples of the inbuilt features of Sandy. It has been liberally sprinkled with light humour and amusing (if not corny) illustrations which add to ease of learning — an easiness lacking from more "serious" program.

The tutorial leads the reader through the installation of all peripherals, explaining how the program is activated, and finally how to start on the first work-file.

It may sound like spoon-feeding, but it does provide excellent coverage for first-time w/p users.

The three chapters following the tutorial contain detailed explanations of advanced features not usually required by the novice, but ideal for the expert.

As mentioned previously, the program comes with two overlays which sit just above the keyboard to indicate the commands accessed by the function keys. This is useful because with shift and control options the Cat can accommodate 24 single-key functions, such as going to the beginning or end of a file.

The program itself also makes good use fo the cursor controls for efficient editing of documents. For example, cursor speeds up as the key is held down.

The package, costing $195, comes equipped with a glossary system that allows all commonly used phrases and addresses to be accessed with three key strokes, thus easing the writing of commonly-used letters. This is recorded in a file marked "Glossary" (strangely enough).

At any stage in the use of this program, the command level can be obtained with a single press of the Break key, making this a good training package for those liable to make horrendous botch-ups in their programming entry (isn't that all of us?)

In conclusion

Overall I was highly impressed with the Sandy Word Processing System.

From the initial reading of the manual to the stage of using all the given facilities, I found all documentation and prompting on the screen clear and concise.

My only complaint is the initial print-out confusion — you must have the cursor at the top of the text to be printed.

The operator is prompted if this is not the case, but otherwise you have to know to 'Home' the cursor (by pressing F1) before saving or printing the document.

This is a well thought out program and is ideal for the home or small business market.

It uses the Cat's facilities well and doesn't baffle the user with jargon.

Sandy was supplied by Dick Smith Electronics ■

New wordprocessing options

by Craig Beaumont

How useful a computer is depends greatly upon the quality of the applications software like word processors, spreadsheets and databases available for it.

Amstrads have a mixed (and rather small) bag of such software.

To be practical this sort of software really needs to be used with a disc drive and printer.

Let's take a look at the word processors.

Tasman Software has dedicated itself to the production of comprehensive yet easy to use word processors.

They have succeeded.

The range includes Tasword 6128, the first program to utilise the RAM disc ability of the 6128.

Other versions are Tasword 464-D, Tasword 464 and Amsword – the last two being equivalent.

Both Tasword 6128 and 464-D have a mail merge facility which allows you to print copies of similar documents with say different addresses taken from a file on disc.

Similarity

One of the features of these programs is their similarity.

You can easily upgrade from one to another learning the new features in a familiar environment.

Files are completely compatible, but Amsword and Tasword 464 have a 10K capacity compared to 22K on 464-D and 64K on Tasword 6128 (this article is 7K long).

Each program has a tutorial file you can work through to get the hang of things, and while you are using the program there are a number of help pads that show what the various keys do.

The manuals cover the features of each program well. They could perhaps have more detail on how to format output for the printer – it took me a process of trial and error and a little wasted paper to get it right.

Editor

One thing that these programs are especially useful for is the editing of Basic programs.

Save the program you want to edit using SAVE"PROG",A then load PROG into one of the word processors.

This is Lectura Light,

This is Compacta,

THIS IS DATA RUN,

This is Palace script,

and this is Median.

You can then do things like giving variables better names using the find and replace function.

Once you think you have finished editing just save the file – it will run fine even though it is of ASCII type, and it may even take up less space on disc.

Alongside these programs Tasman offer Tas-Spell and printer utilities like Tasprint and Tascopy.

Tas-Spell works only with Tasword *464-D and 6128.*

It looks through your document for words that don't match those in it's dictionary. If it finds one you have the options of changing the word, ignoring the word or making Tas-Spell learn the word by adding it to it's dictionary.

Tas-Spell initially has a dictionary of 20,000 words – to which you can add about 8,000 depending on their length.

It took seven minutes to check the spelling of this article, in which time Tas-Spell found 27 words it didn't recognise.

An example of the output of Tascopy was in the Bits & Bytes March issue. It transfers (dumps) whatever is on screen to the printer.

I use this program to put graphs made with Screen Designer on paper to go with text from the word processor.

Tasprint gives you five different type fonts which are accessed by printer control characters you place within the text.

These printer control characters are one of the gripes some have about these programs. This is because one of the desirable features of word processors is that "what you see is what you get". For example to underline a title in Tasword you would place an inverse J at each end of the title – it would be nicer to see a line on screen.

Competitors

Tasman are not the sole producers of Amstrad word processors.

Strong competition comes from Protext, an expansion ROM from Arnor Ltd.

It is very much faster and more refined than Tasman products. It presently lacks a spelling checker and mail merge facility, but these are being produced.

It's speed is especially telling in the saving and loading of files and screen handling – e.g. scrolling and justifying.

As an expansion ROM it leaves 40K of memory free for text and is ready to perform the instant you type IP. ROM's like this should be installed in the mother board – members of the Wellington User Group are looking at making one of these with a number of extra goodies.

I expect Protext to be about twice the cost of Tasword 6128 when it gets here.

New W/Ps

For the 8256 and 6128 a number of CP/M word processors are now on 3-inch disc. New Word, Word Galaxy, Pocket Wordstar and the original Wordstar are some of these. These will be even more costly than Protext.

Given that the 8256 comes with Locoscript for free, and some opinion that Protext is as good in most areas as the CP/M software, then I can see little demand for these products.

Next month we'll have a look at two spreadsheets – Mastercalc and Supercalc II.

A number of people have been interested in how the Wellington Amstrad User Group is getting on.

The monthly meetings have been successful and the last newsletter had articles on: an Amstrad interfacing project, public domain software held in the groups library, PIP in CP/M, basic debugging, computer jargon and cryptic hints for befuddled adventurers.

I hope other groups around the country are as successful.

Acorn visit: - A day in the Fens

by Pip Forer

Since it isn't every year, let alone every month, that I get the chance to visit Acorn headquarters in Cambridge this month's column takes a look at what is happening with Acorn in educational (and other) computing in the UK.

On a general front the BBC micro in its various guises is still in evidence in many areas, notwithstanding the rush to Amstrad for word-processing and cheap games systems.

The Electron continues to sell to a particular group of home users while unbadged BBC mother boards have been incorporated into a range of products, including use in various dedicated communications systems in business, the Reuter's network amongst them.

A few new BBC Bs remain displayed on shop shelves and there is a strong market in second hand Beebs.

Where however were the Masters?

The shopkeepers revealed demand was greater than their supply, a fact confirmed by Bob Coates at Acorn who claimed that in spite of Acorn exceeding their production targets by 10% the machines were going straight off to buyers.

It is pleasing to see that Acorn are continuing their process of consolidating their technology into the market they have traditionally been strongest in, education, while utilising the same technology in other applications where effective.

Their clear strength at present is the range of systems they are able to work with: the processors they support directly include the 6502 and Z80 families, the Intel chips (via the 80186), a 16 bit successor to the 6502 (used currently in the Communicator work station) the NS32016 and a reported RISC chip.

Olivetti of course bring a very deep experience in traditional MS-DOS machines too, a link stressed by the release of the Acorn M19 (see below).

While this breadth can be argued to dilute their efforts it also gives them a flexibility to construct tailor-made systems and respond in various ways to different demands that is not evidenced by many other manufacturers with roots in the micro world.

New products

That flexibility is mirrored in two examples of new products.

One is the Viewpoint Interactive Video Workstation.

The UK is experiencing considerable growth in the area of interactive video being used for job training. This is predominantly in terms of using a computer with a tutoring program to drive a video disk (Philips Laservision being the standard).

In spite of the cost of mastering such disks large corporations, whose training costs may be tens of millions of pounds a year, are increasingly using disks in their staff training programs.

Half a dozen projects are aimed at bringing the same technology to bear on areas of the school curriculum.

Acorn have produced a workstation to drive such a disk based around a BBC system on a 6512 chip and with a custom ROM that contains a variety of standard options plus the Microtext authoring language and specific calls to manage the laser disk.

IBM compatibility

The second instance is the game-plan for the expansion of the capabilities of Econet and MS-DOS machines.

Acorn is releasing its own DOS plus version of the Master (the 512) which will be MS-DOS but not IBM-PC hardware compatible.

To cater for those who need full PC compatibility Acorn is also releasing the Olivetti M19 under Acorn's name.

The question that then springs to most school user's minds is how all this fits in with Econet and networked systems. Will using the 512 mean a new network and new software?

Acorn's answer comes in three stages. Firstly the 512's first networking system is likely to differ from Econet... but most importantly will still use the SAME physical wires.

However, plans are afoot to incorporate the 512 into Econet.

More ambitiously Acorn is to offer a plug-in Econet card for the M19 (and thus for any IBM-PC or hardware clone).

Machines of different types will be able to share the same Econet wiring at the same time, and in an advanced version use the same file server.

The ability to plug together a mix of machines for different purposes, including substantial administration machines, is very attractive and offers great flexibility with access to a very large, multi-brand software base, all on one system.

Acorn are trying to implement these developments now and if they succeed will offer a very valuable facility.

Education focus

A more immediate development which also indicated for me that innovation is alive and well at Acorn is one I can not tell you about just yet: the successor to the Viewpoint workstation mentioned above.

This is an upgrade for a humble Master Turbo that will do the fancy tricks with interactive video that are currently restricted to enormously expensive training workstations. Come August, more will be revealed.

Acorn are recovering lost ground and continuing to focus their resources more coherently to produce a range of products especially suited to education and training. This is starting to produce a great breadth of options at a conventional level.

Europe is also starting to look for a new generation machine specifically for education and Acorn is involved through the European Educational Computer design group (motto 'Amiga non amigo est'). In the longer term continued success will hang on the capabilities of projects such as this.

Software Hits

The BBC software base continues to grow, particularly as MEP from projects that began some time ago begin to mature. Three pieces get special recommendation for this month:

For Viewdata Systems: The Poseidon System. This is a Dutch product for the BBC, now marketed by Acorn. It offers full interactive editing and creation of a teletext database along with user enquiries.

Not a cheap product but it comes in a hard disk version that will provide a full local data base.

For Geographers and other Earth Scientists: Watch out for GeoBase II from Longmans and Gerry Hone at Bath University (due out in June). A fine package for working with data collected on a rectangular grid (geology, contours, population).

For speech synthesis software: Speech! This is a realy cheap package that delivers excellent value; and isn't just a must for Daleks.

In fact Speech! is so good it is going to feature as the review item in next month's column. See you then. ■

When you want speed & quality – we don't look down our noses!

Genisis announce the ARRIVAL of the New NX-10. The new technology printer of the STAR dot matrix range.

EASY FRONT PANEL OPERATION
No more tumbling with dip switches to change modes and functions. With the NX-10, you simply touch a button on the control panel to select the typeface and print pitch, or to print in either draft or near letter quality mode. You can even set margins and align forms.
Only with the Star NX-10.

AUTO PAPER FEED
It only takes a flip of the paper release lever to automatically feed single sheets into the NX-10. They'll be in position and ready for printing. Cut Sheet Feeder Available.

OUTSTANDING PRINT QUALITY
Nothing beats the Star NX-10's precise 30 cps near-letter-quality printing or its superb draft quality printing at 120 cps.

– buy the best.

star

Distributed by:
Genisis Systems Ltd.
47 Station Rd, Otahuhu
Ph. 276-7349, 276-6361
P.O. Box 6256, Auckland

Distributed in Australia by
Genisis Systems Pty Ltd.,
26 Norton Street
Leichhardt 2040, N.S.W.
Australia AA 73872 (GENSIS)

Please send me more information on the NX-10 printer.

Name

Address

Phone

Construction of numeric keypads

by Evan Lewis, PhD

Entering long lists of numbers using a QWERTY keyboard with its numerals spread out along the top row can be very tedious. Typing in machine code in hexadecimal is even worse than decimal.

The solution is a numeric keyboard which can be constructed to include not only the numbers 0 to 9 but also the letters A to E, a delete key, cursor control keys, a carriage return key and whatever else you think might be useful.

Special purpose keyboards such as alphabetically arranged keyboards for children can also be designed quite simply.

An ordinary numeric keypad can be constructed from an old calculator at zero cost.

Solder & wire

No special circuits, hardware or software are required.

Consequently such hard-wired keyboards will work with any package of software you may wish to use.

All you need is a soldering iron, some wire and appropriate switches for the key contacts.

Of course, fully or partially made up numeric keypads are available commercially at a price.

The keypad is wired into the keyboard connection cable inside the computer housing.

There are 64 keys on the Commodore 64 keyboard so you might expect to find 64 wires and an earth connecting the keyboard to the computers main circuit board.

Not so! You will find that a 20 wire ribbon cable and plug are employed.

If compact binary code had been used only 6 wires would be necessary since $2^6 = 64$. However, that would require logic circuitry on the keyboard to produce the binary codes, adding to the cost.

Instead the conversions are carried out on the main circuit board of the computer by a 6526 Complex Interface Adapter (CIA) chip, which is connected to the keyboard by a 20 wire cable.

Matrix

Yes, but why 20? Well four are used as power supply, ground and restore button connections, leaving 16 wires actually connected to the keys. These are divided into two groups of eight wires. One group is used to represent rows and the other represents columns of a conversion matrix (see the table).

As a matter of academic interest lets see how this matrix is used.

To discover whether a particular key (E for example) is being pressed, a voltage is applied to the wire representing the appropriate column of the table (ie column 1 which is connected via pin No.19). This is connected to one of the contacts of the switch under the 'E' key. The other contact of the switch is connected to pin 6 which represents row 6. If the CIA chip detects a signal appearing on row 6 when a voltage is being

(Continued on page 54

TABLE I.

Commodore 64 Keyboard Decoding Table.

Arranged According to Pin Connections.

PIN CONNECTIONS FOR COLUMNS

PIN	13	14	15	16	17	18	19	20	PIN / ROW
5	f7	home	-	0	8	6	4	2	3*
6	f5	↑	@	O	U	T	E	Q	6
7	f3	=	:	K	H	F	S	Comm	5
8	f1	null	.	M	B	C	Z	space	4*
9	↓	/	,	N	V	X	shift	stop	7
10	→	;	L	J	G	D	A	CTRL	2*
11	CR	*	P	I	Y	R	W	←	1*
12	del	£	+	9	7	5	3	1	0*
PIN / COL	0*	6	5	4*	3*	2*	1*	7	ROW / COL

PIN CONNECTIONS FOR ROWS

ROW NUMBERS

COLUMN NUMBERS

* indicates connections to joystick control ports

Comm is the Commodore key.

CR is the carriage return or enter key.

CTRL is the control key.

Null is no key represented by CHR$(0)

Note: The Commodore 64 and VIC 20 keyboards are identical and interchangeable since they have the same pin connections. The numeric keypad will work on either machine too even though the logical assignment of row and column numbers are different and a different decode matrix is used in the VIC 20.

applied to column 1 it knows that the 'E' key must have been down at the time.

To detect which keys are being pressed the computer must rapidly scan through all 65 possible combinations of rows and columns. Having determined which key is being pressed the appropriate ASCII code is recorded by the microprocessor chip (the 6510). Graphic and special characters are detected by simultaneous closure of a normal key and the shift, Commodore or control key giving a total of 256 possible key codes.

The CIA chip treats the signals on the eight row lines as a byte of memory at address 56320 which is used as output to the keyboard. Similarly the byte at address 56321 represents the rows of the table and is used as input. (These are the A and B parallel ports of CIA chip number 1.)

Typewriters

Standard QWERTY typewriters follow a convention which is very similar to the Commodore conversion matrix and the wiring methods described here are similar to those used for converting typewriters into letter quality computer printers (see E.T.I. October 1983 p.21.).

So much for theoretical background. To make use of it we have to tap into the 16 row and column wires or at least some of them. Actually rows 0 to 4 and columns 0 to 4 are connected to joystick ports 1 and 2 respectively making 5 x 5 = 25 key codes available through these convenient plugs.

Examination of the table shows, however, 1, 2, –, . and E keys are not included in the reduced 5 x 5 matrix, making the joystick ports useless for this purpose unless software is provided to change the decoding table. (This is how some commercially available numeric keypads work.)

Direct tap

To avoid possible conflict with various software packages it is preferable to tap directly into the 20 pin plug mounted on the printed circuit board.

For those who are sufficiently adept with a soldering iron it is possible to solder a ribbon cable directly to the bases of the pins in such a way that the original keyboard socket can still be plugged in.

(Expose a short section of wire and tin it with an adequate but not excessive amount of solder. Position it beside the base of the pin. A quick touch with a small iron will provide good contact.)

It would be more advisable, however, to use a 20-pin plug and socket pair to provide simultaneous plug-in connection for both the original keyboard and the ribbon cable leading to the numeric keypad.

On the printed circuit board of the computer pins 5 to 12 represent the rows and pins 13 to 20 represent the columns. But they are not arranged in the same order as the bit positions recognised by the CIA chip and shown on the circuit diagram in the "Programmer's Reference Manual".

Both numbering systems are provided in the accompanying table, but it is the pin numbers which are required for wiring the keypad.

Recircuit

Mount another 20 pin plug on the keypad circuit board to allow convenient connection to the ribbon cable. Scrape any existing printed circuit off the back of the keypad and replace it with your own wiring as follows:

Run an insulated wire from pin 5 to the switches for the –,0,2,4,6 and 8 keys (note that all of the odd numbers are on row 3 of the table and are connected to pin 5). Similarly connect pin 12 to +,1,3,5,7,9 and the delete key.

Connect pin 8 to the decimal point key and if the letters A to E are included make the following connections: Pin 8 to B and C; pin 6 to E, and pin 10 to D and A. Connect the carriage return (enter) key to pin 11.

Now a similar procedure is carried out to connect the appropriate column pins to the other contacts on the key switches. Connect pin 13 to enter and delete; pin 15 to +,– and decimal point; pin 16 to keys 0 and 9; pin17 to 8, B and 7; pin 18 to 5,6,C and D; pin 19 to 3,4,E and A; and finally connect pin 20 to keys 1 and 2. ■

Games bonanza!

by Andrew Mitchell

Here are six games, all on tape, offered through Alpine Computing, which is offering a mail order service.

BATTLE THROUGH TIME

You are sent back through time with an "all terrain vehicle" and to get back to your own time (2525AD) you must fight through various time periods.

The vehicle is like that found in Moonbuggy and the action is very similar, with the flying perils changing to match the time period (eg bi-planes in 1914).

The graphics are simple but effective and the background music can be turned on/off, which I think is always a good point. — $24.95

SPACE PILOT

Similar scenario to the above except your vehicle is a plane this time.

You have to shoot 56 planes in each era, then a mother-ship.

The cover describes the "breath-taking graphics" but they are rather blocky in my opinion.

In one era it looked like I was shooting at planes from the previous time period. The action is very fast and a continuously shooting joystick would have been a great help.

I think I'd soon have become bored. — $29.95

GATES OF DAWN

This is a type of graphic adventure game.

You are dreaming and play a knight moving through various rooms and passages.

You find various objects and can pick them up and use them. You fight various demons and monsters, and each room has its own traps and illusions.

The graphics are average, and the action rather limited, however I think a dedicated game player wanting something different could be attracted.

The music is nothing special, even a little tedious after a while. — $29.95

SORCERY

Similar to Gates of Dawn but in outside scenes rather than rooms.

You play a sorcerer trying to save the world from the Necromancer.

I know someone addicted to this game on a Spectravideo and there is a lot more involved in playing than first meets the eye.

The graphics are good, music is supportive and the action has to be fast if you don't want the meanies to suck your life away. — $29.95

LAZY JONES

What a great little game. You are Lazy Jones, the cleaner in a hotel, but as 15 of the 18 rooms in the hotel contain video games you would much rather play them than do any cleaning.

The other three rooms contain a bed, brooms or loo; none are deadly, just a waste of game playing time for Lazy Jones.

The graphics are simple but clear, and the music causes no problems to the listener.

This is really 16 games in one, as you play each of the games in the rooms separately. — $24.95

GHETTOBLASTER

Now for something completely different! A non-violent game about delivering cassette tapes for a record company.

Having obtained tape, and batteries you can use your ghettoblaster to make the people in the street buggie-on-down, while on your way.

The printed instructions include a map of the town, so you shouldn't get lost.

There are some meanies to avoid, including a "tone-deaf jaywalker" who bumps into you, breaking the ghettoblaster which you have to have repaired in order to get people dancing again.

Graphics are good, and the music makes full use of the C64 capabilities. — $29.95

Each of these tapes comes with full instructions and I'm pleased to see the quality of these instructions improving as each month passes.

This was really a very high quality selection and represents the latest in what's offering.

Each game represents at least reasonable value for money, with the top two or three being excellent value. My order of ranking are:

1. Lazy Jones
2. Ghettoblaster
3. Sorcery
4. Battle Through Time
5. Gates of Dawn
6. Space Pilot ■

Machine Language

FOUND

Last months "Notes on the Riteman C+", by Joe Colquitt, included reference to machine-code listings to rotate bitmap characters.

If you had looked in vain for the MC programme "reproduced below" and not found it... then it's fortunate you're now reading this.

Reproduced below is the (found) listing:

Output program 1

```
5 C=C+1:IFC=1THENLOAD"bitmap screen",8,1
6 IFC=2THENLOAD"BM ML",8,1
10 POKE53265,PEEK(53265)OR32
20 POKE53272,PEEK(53272)OR8
40 FORI=0TO999:POKE1024+I,I:NEXT
45 SYS49288
50 FORJ=0TO24:REM # OF LINES
55 OPEN3,4:PRINT#3,CHR$(27)"3"CHR$(22);
60 PRINT#3,CHR$(27)"K"CHR$(64)CHR$(1);
70 FORI=1TO320:A=PEEK(8191+I+J*320)
80 PRINT#3,CHR$(A);
90 NEXTI
100 PRINT#3:CLOSE3
105 NEXTJ:SYS10
```

Output Program 2

```
5 C=C+1:IFC=1THENLOAD"REDEFINING DATA",8,1
10 IFC=2THENLOAD"SCREEN",8,1
20 POKE53272,28:POKE53265,59
30 SYS49313
40 REM LINES 40-105 AS PER PROGRAM 1

READY.

99 REM MC FILE CREATOR
100 R=49152:FORI=0TO276:READML$
105 IFLEFT$(ML$,1)="X"THENI=I-1:GOTO115
110 A=VAL(ML$):POKER+I,A:CK=CK+A:GOTO125
115 C=VAL(RIGHT$(ML$,5))
120 IFCK<>CTHENPRINT"ERROR",ML$,A:END
125 NEXT
130 PRINT"■POKE52,208:POKE56,208:CLR"
135 PRINT"■POKE43,0:POKE44,192"
140 PRINT"■POKE45,21:POKE46,193"
145 PRINT"■SAVE"CHR$(34)"BM ML"CHR$(34)",8,1"
150 POKE198,5:POKE631,19:FORI=0TO3:POKE632+I,13:NEXT
200 DATA 160,0,162,0,44,0,96,48,3,76,X00589
205 DATA 22,192,24,185,0,32,125,127,192,153,X01641
210 DATA 0,32,232,238,5,192,224,8,208,230,X03010
215 DATA 162,0,30,0,96,232,224,8,208,248,X04218
220 DATA 173,135,192,141,5,192,200,192,8,208,X05664
225 DATA 207,24,173,135,192,105,8,141,135,192,X06976
230 DATA 141,5,192,141,14,192,141,20,192,141,X08155
235 DATA 33,192,144,12,238,6,192,238,15,192,X09417
240 DATA 238,21,192,238,34,192,173,6,192,201,X10904
245 DATA 128,208,163,169,32,141,15,192,141,21,X12114
250 DATA 192,169,96,141,6,192,141,34,192,169,X13446
255 DATA 0,141,5,192,141,14,192,141,20,192,X14484
260 DATA 141,33,192,141,135,192,96,128,64,32,X15638
265 DATA 16,8,4,2,1,0,169,32,133,251,X16254
270 DATA 169,0,133,250,168,145,250,200,208,251,X18028
275 DATA 230,251,166,251,224,64,208,243,76,0,X19741
280 DATA 192,162,0,169,0,133,252,169,48,133,X20999
285 DATA 253,234,234,234,234,234,189,0,4,133,X22748
290 DATA 20,169,0,133,21,6,20,38,21,6,X23182
295 DATA 20,38,21,6,20,38,21,24,165,20,X23555
300 DATA 101,252,133,252,165,21,101,253,133,253,X25219
305 DATA 160,7,177,252,153,0,96,136,16,248,X26464
310 DATA 24,173,215,192,105,8,141,215,192,144,X27873
315 DATA 3,238,216,192,232,208,182,238,178,192,X29752
320 DATA 173,178,192,201,8,208,170,169,96,141,X31288
325 DATA 216,192,169,4,141,178,192,162,0,169,X32711
330 DATA 1,157,0,4,157,0,5,157,0,6,X33198
335 DATA 157,0,7,232,208,241,96,X34139

READY.
```

User-defined data types

by Bruce Simpson

This month I will try to explain the advantage of Pascal's user-defined data types.

The following is not intended to be a tutorial on Pascal programming, rather it is an attempt to show how this ability makes Pascal a very powerful language for database type programming.

Pascal is not the only language to offer this facility, many other computer languages (such as COBOL) also allow the programmer to create new data types.

What is a data type? When information is stored in the computer's memory, it must normally be classified as a particular type. BASIC for instance recognises two elementary types: Strings and Numbers. Most modern implementations of BASIC further define numbers as being Integers, Single Precision, or Double Precision.

Why have different data types? Indeed there are a number of languages that do not differentiate between data. Many assembly languages as well as some higher level languages such as BCPL use untyped data. BCPL was specially designed for writing programs where the type of data being manupulated is of no consequence to the program's ooperation. The creation of operating systems and compilers is often suited to this untyped form of programming language.

There are two main reasons for using 'typed' data in a programming language.

1: Ease of programming. Imagine the difficulties involved in writing a mailing list program if your language could handle only numbers (early versions of Fortran had this exact problem). Similarly try to write an engineering program in SNOBOL which is basically a 'strings only' language.

2: Program reliability. If your data must conform to one of a fixed number of types, the language you are using can automatically check to see if the programmer has made fundamental errors such as trying to divide a number by a string. Without data typing, this kind of error is undetectable and will produce unpredictable results which are very difficult to trace.

Pascal vs Basic

Let's look at a typical 'real world' situation where a user-defined data type can save a lot of work.

Imagine we are writing a program that will keep an inventory of all our cassette tapes. This system will mimick a manual index card file system and as such, we need to store the following information on each tape:

```
Title ..... (up to 30 characters)
Group ..... (up to 30 characters)
Music Type ... (up to 10 characters,
               'Rock', 'Classical',
               etc)
Media Type ... (up to 10 characters,
               'Metal', 'Chrome',
               etc)
Tape Length . (numeric, 45 to 120
               minutes)
```

These individual pieces of information (Title, Group, etc) are called FIELDS. A group of these fields for any individual cassette tape (the equivalent of a single index card) would be called a RECORD.

Using BASIC, we would be forced to use the following data types for the fields:

```
Title ..... TITLE$
Group ..... GROUP$
Music Type ..... MUSICTYPE$
Media Type ..... TAPETYPE$
Tape Length ..... Length
```

Using Pascal, we could define the following data types and at the same time group these fields together to form a record:

```
Type
  Cassette-Type = Record
                    Title      : String(30):
                    Group      : String(30):
                    MusicType  :String(10):
                    MediaType  :String(10):
                    TapeLength: 45..120
                    End:
```

Ok, what's the big deal? you're probably saying. so far Pascal has taken a lot more work to achieve the same result but let's see what happens when you wish to set up an array in memory that will hold the data:

```
DIM TITLE$(100), GROUP$(100),
    MUSICTYPE$(100), MEDIA-
    TYPE$(100), TAPELENGTH(100)
```

Pascal allows us to set up the same array for all the separate pieces of data at once by using this line:

```
Var Tape: Array (1..100) of Cassette-
    Type:
```

Now Pascal is making life simpler for the programmer. Things change even more when you wish to sort your cassette tape information into a particular order. Because BASIC has no way of knowing that the individual fields (TITLE$(), GROUP$(), etc) are actually all part of a single index card, the programmer must write the following code to replace one array entry with another:

```
TITLE$(10)=TITLE$(99)
GROUP$(10)=GROUP$(99)
MUSICTYPE$(10)=MUSICTYPE$(99)
MEDIATYPE$(10)=MEDIATYPE$(99)
TAPELENGTH(10)=TAPELENGTH(99)
```

Pascal: Part III

The same operation with our Pascal program becomes:

```
Tape(10) := Tape(99):
```

As you can see, Pascal is able to treat all the information relating to each cassette tape as a single entity. Tasks such as sorting (where a large number of array entry swaps are necessary) become much simpler to write and understand.

It is also much easier to write programs that use disk files in Pascal because of this ability to define data records. Consider the following example in BASIC where we open a random access file to store our information:

```
OPEN "R",1,"TAPES.DAT",82
FIELD 1, 30 AS DTITLE$, 30 AS
   DGROUP$, 10 AS
   DMUSICTYPE$, 10 AS DMEDIA-
   TYPE$, 2 AS DTAPELENGTH$
```

In Pascal this becomes:

```
Var TapeFile: File of Cassette-Type:
Begin
  Assign(TapeFile, 'TAPES.DAT'):
  ReSet(TapeFile):
```

In the BASIC version a programmer would have to get out his calculator and work out the combined size of all the different fields (82 bytes). It is also necessary to produce code that will field a set of strings to hold the data prior to a disk write and after a disk read. All of this is performed automatically by the Pascal compiler.

To write a new set of data at the 10th record in the file requires this code in BASIC:

```
LSET DTITLE$=TITLE$(X)
```

1986 WELLINGTON COMPUTER SHOW

FOCUS: The Uses of your Personal Computer; Communications Emphasis.

OVERSEAS PASSENGER TERMINAL

THURSDAY 10th JULY, FRIDAY 11th JULY, SATURDAY 12th JULY.

COMPUTER COMPANIES – IF YOUR MARKET INCLUDES WELLINGTON HEAD OFFICES AND BUSINESSES AND GOVERNMENT AND THE WELLINGTON PUBLIC, YOU SHOULD BE EXHIBITING AT THE 1986 WELLINGTON COMPUTER SHOW.... BOOK YOUR SPACE NOW!

CONTACT:

Marc Heymann 1986 Wellington Computer Show
P.O. Box 27 205
Wellington. Phone (04) 844 985

Vicki Eckford
(04) 753 207

Gaie Ellis Bits & Bytes
Box 9870
Phone (09) 796 684

Jocelyn Howard
Christchurch
Phone (03) 66 566

SEMINARS: A range of seminars on major areas of interest will be presented by professionals.

FOR BUSINESS PASSES, PLEASE COMPLETE COUPON AND POST...
We are interested in seminars on the following:

- Selecting a Business ..... ☐
- Guide to Spread sheets ..... ☐
- Guide to Word processing ..... ☐
- Guide to Databases ..... ☐
- Guide to GST and Computing .... ☐
- CAD for arcitects and engineers .... ☐
- Computers and education ..... ☐

Communications Seminar series:

- Networking & LANS ..... ☐
- Integrating a companies communications with compute: ... ☐
- Videotex and databases ..... ☐
- Office Automation ..... ☐

NUMBER OF PASSES REQUIRED: .....

NAME:.....ADDRESS: .....

POSITION: .....

COMPANY: .....

Return to: 1986 Wellington Computer Show, P.O. Box 27-205 Wellington
PH. (04) 858-589

```
LSET DGROUP$=GROUP$(X)
LSET DMUSICTYPE$=MUSICTYPE$(X)
LSET DMEDIATYPE$=MEDIATYPE$(X)
LSET DTAPELENGTH$=MKI$(TAPE-
    LENGTH(X)
  PUT #1,10
  In Turbo Pascal:
  Seek(TapeFile,x):
  Write(TapeFile,Tape(10):
  in Pascal MT+
  TapeFile^:=Tape(x):
  SeekWrite(TapeFile,10):
```

Being able to treat all the separate fields as a single data record is very convenient, but how do you separate them out if you need to print out the title of a tape? Very simple, you only have to use the name of the record (TAPE[x]) and then the name of the field you wish to refer to (Title). These two parts (record name and field name) should be separated by a full stop. eg:

```
WriteLn(Tape[10].Title),
```

will cause the title of the tenth entry in the array of tapers to be displayed. Similarly...

```
WriteLn(Tape[10].Group),
```

will display the Group for the tenth entry.

Pascal's ability to group data together into a user-defined record, which may be treated as a completely new data type may be somewhat confusing to BASIC programmers at first. A small amount of effort and experimentation however will reveal how useful this can be.

That's the tutorial for beginners, now for the experts... On the same subject of data records, do you know what will happen if you run this program?

I won't tell you what will happen (try it for yourself), but you may find that the results are not what you would expect. A clue is that the WITH statement is a 'compile time' instruction, not a 'run time' one. Being aware of what happens can save many hours of head scratching, believe me, I found out the hard way.

Now time to answer my mail.

Rupert Glover from Christchurch has written asking me if I know of a good pascal compiler for the Commodore 64, something in the vein of Turbo. He has seen Pascal 64 and G-Pascal but neither of these are suitable.

Unfortunately I can't help here, perhaps some of the Commodore users out there may be able to assist. Please drop me a line if you can.

Steve Peacocke (author of the Amstrad Trader Series accounting software) has written about my solution to the binary maths errors found in some Pascal compilers. He quite rightly points out that many Pascals (including Turbo) will restrict the maximum integer value to 32,767. This means the largest dollar amount you could handle using my technique is 327.67.

He offers us a solution that goes part of the way to solving the problem.

I will include this in next month's column. Anyone using a compiler which supports long integers should have no problems since the long integer type is typically capable of representing values up to 2,147,483,648, which would allow dollar values of over $21 million.

That's if for another month.

```
PROGRAM WithTest;

Type      NumType = Record
                      Value   : Integer;
                      Written : String[10]
                    END;

Var       Number : Array [1..5] Of NumType;


Procedure INIT;
(* initialise the data in the array of records *)
Var  Count : Integer;
BEGIN
  For Count := 1 to 5 Do
    Number[Count] := Count;
  Number[1].Written := 'One';
  Number[2].Written := 'Two';
  Number[3].Written := 'Three';
  Number[4].Written := 'Four';
  Number[5].Written := 'Five'
END;   (Init)


Procedure TEST;
Var Count : Integer;
BEGIN
  For Count := 1 to 5 Do
    With Number[Count] Do
      Writeln('The value of ',Written,' is ',Number)
END;  (Test)


BEGIN  (WithTest)
  Writeln('Test of the WITH statement');
  Writeln;
  Init;
  Test;
  Writeln('End of Test')
END.  (WithTest)
```

The BITS & BYTES Computer Book Club

a fun month with your computer

Take advantage of these special bargains

BUY at our prices and . . . SAVE $2.00 on each book

The club: how it works and what you get.

All you have to do to join the club is buy a book. Just pick out the books you want, fill in the coupon in the middle of the magazine, and post it in FREEPOST.

We offer savings on the cash price you pay for each book

Please allow three to four weeks for orders to be processed and the book distributors to get the books to you.

THINGS TO DO — Willis & Miller
• $7.95 each

Things To Do With Your Apple Computer — Morrice
Things To Do With Your Atari Computer — Morrice
Things To Do With Your Commodore 64 Computer
Things To Do With Your Commodore/VIC20
Things To Do With Your TRS80 Model 4 — Maddux
Things To Do With Your IBM Personal Computer — Morrice
Things To Do With Your Osborne Computer
Things To Do With Your TI-99/4A Computer — Johnson

COMPUTER GAMES — Edited by Tim Hartnell
• $12.95 each

Games for Your Apple IIe — Dyson/Englehardt
Games for Your Atari — Bunn
Games for Your Atari 600XL — Ryan/McConnell
Games for Your BBC Micro — Gollner
Games for Your Commodore 64 — Brennan
Games for Your Dragon — Gifford
Games for Your Oric — Shaw
Games for Your Spectravideo — Pillinger/Olesh
Games for Your TRS80 — Palmer
Games for Your VIC20 — Gowlay
Games for Your ZX81 — Charlton
Games for Your ZX Spectrum — Carter
More Games for Your BBC Micro — Gollner
More Games for Your Commodore 64 — Young
More Games for Your Oric — Shaw
More Games for Your VIC20 — Nelson
More Games for Your ZX Spectrum — Carter
More Games for Your ZX81 — Gifford/Vincent
Adventures for Your BBC Micro — Gollner
Adventures With Your Commodore 64 — Quirie
Adventures With Your ZX Spectrum — Gifford
Action Games for Your ZX Spectrum — Charlton

GETTING STARTED — Edited by Tim Hartnell
• $9.95 each

Getting Started on Your Atari — Bunn
Getting Started on Your BBC Micro — Gollner
Getting Started on Your Commodore/VIC20 — Ramshaw
Getting Started on Your Oric — Shaw
Getting Started on Your Spectrum — Hartnell
Getting Started on Your ZX81 — Hartnell

BASIC MADE EASY — Garry Marshall
• $13.95 each

BASIC Made Easy for Your Acorn Electron
BASIC Made Easy for Your BBC Microcomputer
BASIC Made Easy for Your Commodore 64
BASIC Made Easy for Your VIC20
BASIC Made Easy for Your ZX Spectrum

Our new selection

The Robot Book — **Richard Pawson**
Intended for anyone wanting to add a robot to a machine, to people who might buy robots that do not require a home computer, or anyone interested in new technology. Deals with the history of robots, then outlines 30 inexpensive home robot projects. Full details are given on construction.
Windward — **Our price $34.20. Save $2.75.**

Beneath Apple ProDOS — **Don Worth & Pieter Lechner**
Written as a companion to the manuals for the Apple II Plus, IIe and IIc, providing additional information. Each chapter stands on its own, covering DOS; disk and diskette formatting; volumes, directories and files; structure of ProDOS; using ProDOS from assembly language; customising ProDOS; ProDOS global pages; example programs; disketter protection schemes; nibblizing; the logic state sequencer; ProDOS, DOS and SOS.
Brady — **Our price $55.35. Save $4.30**

Mastering the IBM PC — **Peter Norton**
Goldmine of insights, techniques and technical data. The first comprehensive reference guide to the entire IBM family of personal computers.
Penguin — **Our price $46.25. Save $3.75.**

Apple Works: Boosting Your Business with Integrated Software — **Charles Rubin**
Shows experienced computer users how to share information easily and efficiently among Apple Works' spreadsheet, word processor and database manager. Also offers information on the more technical aspects of the Apple Works system.
Penguin — **Our price $41.65. Save $3.35.**

Advertisers index

Classified

COMMODORE 64: LATEST COPY PROgramme from USA. Ultrabyte Disk Nibbler. Copies 99% +. As advertised in Compute Gazette. Regular update. Send S.A.E. to:
Authortech
2/34 Buffon St
Christchurch 2

APPLE II AND IBM PC SOFTWARE FOR sale. Write for large list: Software, 125 Sparks Rd, Christchurch 2.

MSX SOFTWARE AT BARGAIN PRICES plus new titles, including imports, available post free. Send for free catalogue to: – Micro Craft, Box 163, Cromwell, Central Otago.

WANTED TO BUY: AMSTRAD 464 ($575) or 664 ($800) Green Screen. Write to William Lau, 6 Watters Pl, Napier.

FOR SALE: SEGA SC-3000 32K COMPUTER including Starjacker cartridge and over 55 programs. $125 ono. Write to William Lau, 6 Watters Pl, Napier.

FOR SALE: SOFTWARE FOR THE Commodore 64. Send stamped S.A.E. for titles. Write to: Neville Lee, 15.O.R.D., Oamaru.

APPLE II EUROPLUS 64k DISC DRIVE, green screen, Inerten basic card. $800. Phone 501 975.

FOR SALE: SPECTRAVIDEO 328, DATA Cassette, youstick (quickshot2) manual, Basic reference manual, Justwrite Jr and 6 tapes. $650 ono.

FOR SALE: VZ200, DATA CASSETTE, 16K ram module, manual, book, and tapes. $250 ono.

FOR SALE: APPLE IIe, MONO SCREEN, single disk drive. Graph plotter, printer interface. Some software – Apple logo, Pascal – $2000 ono.
OSBORNE I $1500 or offer.
Contact Wanganui Girls College, P.O. Box 6000, Wanganui East. Phone 39-141.

FOR SALE: PRINTERS; SHARP. IO – 2824 15" carriage 150 CPI dot matrix. Offers requested. Ph 679 440 (Auckland).

FOR SALE: SPECTRAVIDEO 328 COMputer with 605A expander unit including one disk drive with option of disk basic or CP/M operating system, 80 column display cartridge, 64K RAM cartridge, and centronics printer cable. Also, CP/M Calc-star spreadsheet software, two boxes of disks, two joysticks, cassette recorder and 11 software tapes. Two extra reference books included. All for $1500. K. Warrington, P.O. Box 71, Dannevirke. Ph 6035 or 6813.

FOR SALE: MACINTOSH 512k $3500. Please contact Hubert Shanson. Ph 482 009 ext 413, Christchurch.

COMMODORE-64 USERS. JOIN N.Z.'s leading Commodore Club. Low subscription ($15 p.a.). Quality club magazine. Large public-domain software library. "Out-of-town" members especially welcome. Write to P.O. Box 860, Nelson.

FOR SALE: TRS 80 COLOUR COMputer ROM-Packs from $10 each. Send SAE for details, P.O. Box 12 129, Christchurch.

COMSEC: WE TRADE NEW AND USED computers, and peripherals. If you want to sell or buy any computer equipment write to P.O. Box 30, Waihi Beach South.

Read what the experts say:

"...the C128 will be the lowest priced personal computer to bridge the gap between home and office."
RUN Magazine

"...a versatile machine with one of the most powerful basic programming languages ever offered in a microcomputer."
COMPUTE! Magazine

"The C128 is an outstanding product.
...it deserves to be one of this years's most successful machines." **PCW** Magazine

C=COMMODORE 128
Personal Computer

Powerful computing that speaks for itself!

After an accolade like that its hard to know what to say! But seriously now, Commodore have done it again with this brilliant three-in-one computer package. Commodore 128 personal computer — the only computer ever designed to bridge the gap between serious business applications, and the home.
The Commodore 128 takes you through the serious part of the day with ease, no matter what you do for business, education or learning and with the flick of a switch you can take a break and play games with the kids! And that's responsibility that speaks for itself!

64K Mode

In this mode the Commodore 128 reproduces all the features of the Commodore 64, the worlds top-selling home computer, making it ideal for the first time user or for experienced 64 owners wanting to upgrade. Best of all - existing 64 Software and peripherals are instantly compatible.

128K Mode

In its native mode the 128 really begins to break new ground with 119.5 RAM available to the user to program in BASIC. Expandable to 512K. Over 140 commands in BASIC 7.0 for logical, structured programming making sound and graphics easy to master. Built in machine language monitor, 80 or 40 columns display (ideal for word processing). A 14 key numeric keypad, and more!

CP/M Mode

Using the Z80A microprocessor the 128 transforms into a business computer running CP/M Plus version 3.0, the latest version of the most popular business operating system for 8 bit micro computers. Famous programs such as dBase II, Wordstar, Calc-star and all of the most used applications together with many specialist packages; 80 columns.
The C128 CP/M mode reads various 5¼" CP/M disk formats.

Business Partner, Manager, Artist, Poet, Novelist, Mother of 3, Game's Master, Teacher, Student, Mechanic, Musician...

Find out more!

C=COMMODORE 128
Personal Computer
the intelligent decision!

COMMODORE COMPUTER (NZ) LTD
P.O. BOX 33-847, TAKAPUNA
AUCKLAND. PHONE (09) 410-9182

Yes! Please tell me more about the amazing C128

NAME .....

ADDRESS .....

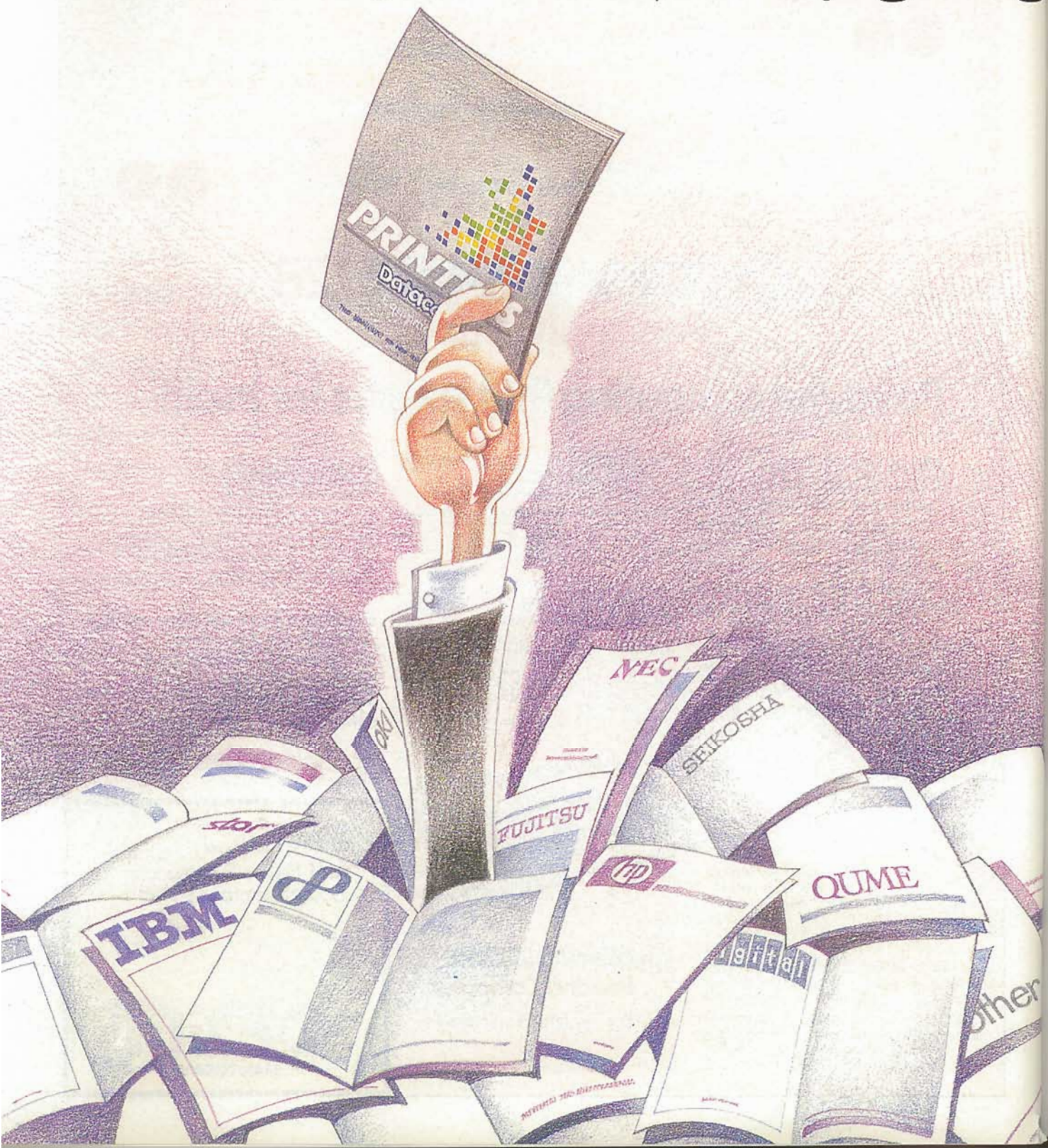
.....

.....

PHONE .....

MAIL TODAY! AGBB 6

Don't bury the subject by going



into brochures too deeply.

Trying to sort through the hundreds of brochures on printers can leave you buried with confusion. Because there's so many printer brochures that leave so many questions unanswered.

Questions such as, will it be the right printer for the job? What's the difference between impact and laser printers and which will suit me best? Will the printer be compatible with our computers and other information equipment? Plus, most importantly, is the printer the latest or will it soon be out of date?

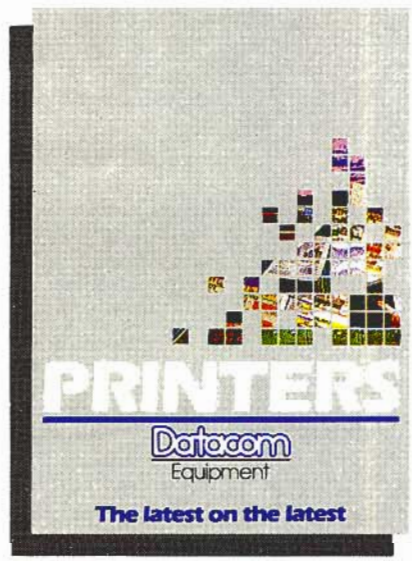
And, with the sheer number of brochures, you almost need to be a librarian to cope!

Datacom Equipment have just one brochure that'll rescue you from this "Brochure Overload."

It's a glossy catalogue of the latest printers from the world's leading suppliers that doesn't gloss over your unanswered questions.

Quick reference summary charts tell you whether the printer is right for your needs. Full product descriptions tell you what the printer really does. It's the latest on the latest printers, in one easy to follow package.

Cut out the coupon alongside and you'll cut out being buried by other confusing printer brochures. Mail the coupon and we'll also send you a copy of the Datacom Equipment corporate brochure.



Datacom
Equipment

Suppliers of the world's most advanced Information Equipment.

Auckland (09) 389-599
Wellington (04) 846-189
Christchurch (03) 797-498

Please send me a copy of your comprehensive printer catalogue, plus, a copy of your corporate brochure.
Post coupon to Datacom Equipment, PO Box 6541, Wellington.

Name .....

Company .....

Address .....

.....

.....

RIALTO DEL 4025 B&B

PC16-220

Personal Computers

Simply the best value in personal computers.

Only available from:

HITEC MICRO LTD.,

91 Custom Street East, Auckland 1. Ph. (09) 399-183